The RUBBER AGE

May, 194

TECHNOLOGY DEPARTMENT

DUSTLESS ACCELERATORS

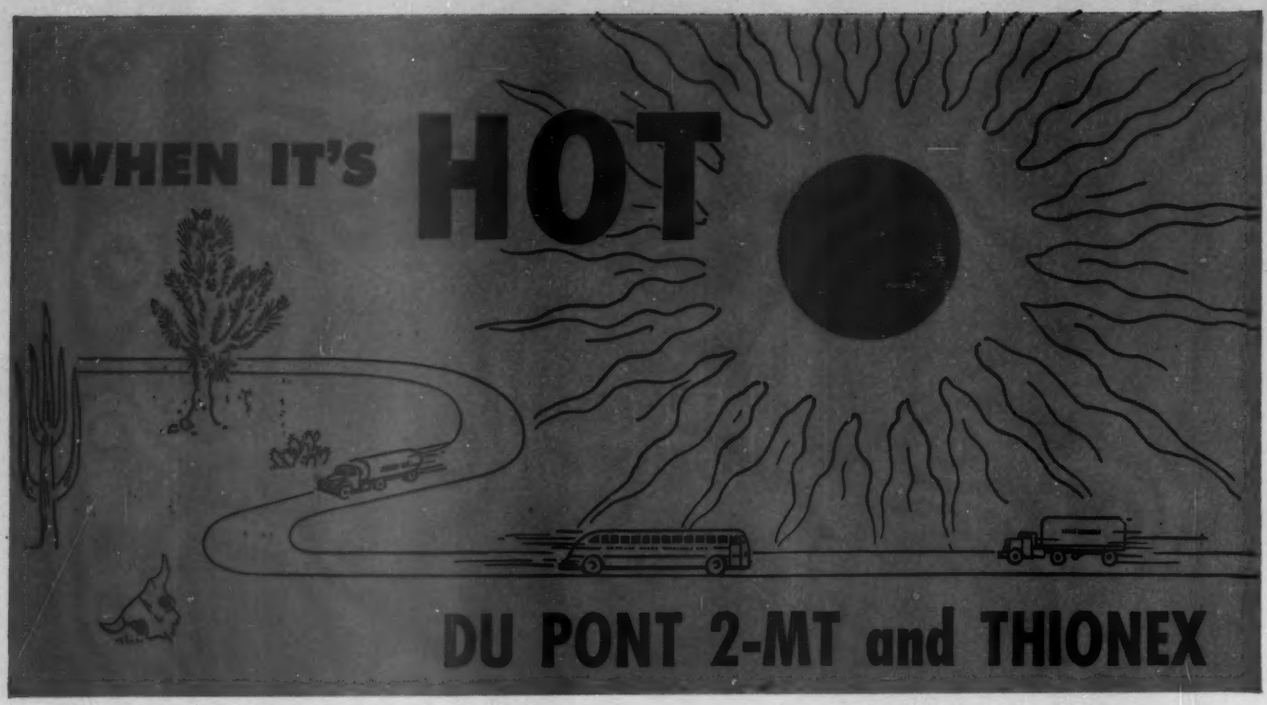
Experimental work to eliminate dusting in the compound room and mill room has produced

Rodform Products

These Rods, Tabs or Tablets are available for sampling as you may request. They are practically 100% dustless and disperse splendidly in rubber.

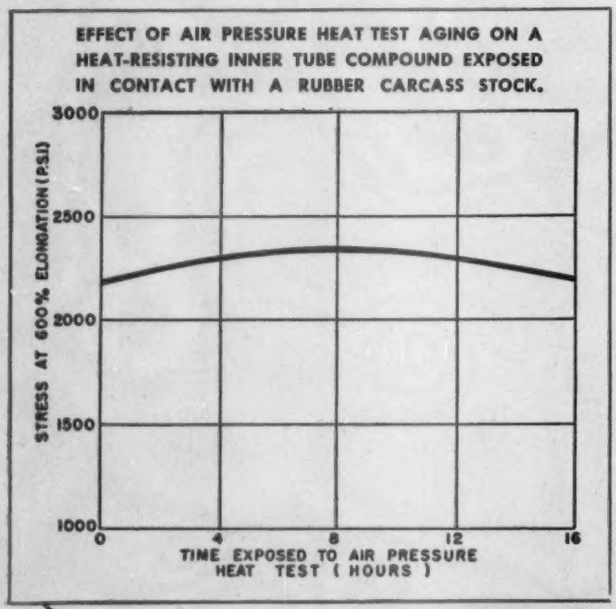
R. T. VANDERBILT CO. Inc.

230 PARK AVENUE, NEW YORK 17, N. Y.



HEAT-RESISTING INNER TUBE COMPOUND

Smoked Sheets	100.0	Fine Thermal Carbon Black	40.0
NEOZONE A	1.25	Stearic Acid	1.0
AKROFLEX C	0.75	2-MT	1.75
RETARDER W	0.5	THIONEX	0.1
Zinc Oxide	5.0	Sulfur	1.0

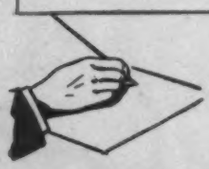


will protect inner tubes from reversion failures

INTER-CITY trucks and buses are hard on their inner tubes. For sustained periods of time these inner tubes may operate at temperatures in excess of 250°F. Under such service conditions, adequate retention of physical properties requires protection against reversion. The use of 2-MT acceleration, activated by a small amount of Thionex, will result in increased heat resistance with consequent improvement in tube life.

Test data shown graphically at left for a typical high quality natural rubber heat-resisting inner tube compound show that 2-MT-Thionex acceleration *protects against reversion*. To simulate service conditions, this compound was exposed to the Air Pressure Heat Test in intimate contact with a typical rubber carcass compound. Even after 16 hours in the Air Pressure Heat Test there was no tendency toward reversion as judged by stress at 600% elongation.

Tune in to Du Pont "Cavalcade of America," Monday Nights—NBC Coast to Coast



More complete data . . .

on the use of 2-MT and Thionex in inner tubes may be found in Report BL-224, "2-MT Acceleration for Heat-resisting Rubber Inner Tube Compounds." If you would like an extra copy, write:

E. I. du Pont de Nemours & Co. (Inc.), Rubber Chemicals Division, Wilmington 98, Delaware.

DU PONT RUBBER CHEMICALS

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DU PONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

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TWO NEW PLASTICIZERS FOR VINYL RESINS

C LIBRARY
MAY 29 1948
DETROIT

New Hycar Nitrile Polymers make processing easier and widen fields for makers of many products

THIS news is important to any company dealing in any way with the vinyl resins. The new Hycar EP (easy processing) and Hycar NS (easy-processing, non-staining) offer exceptional advantages. These are nitrile rubbers that really *blend* with the vinyls. Check these properties:

★ **PERMANENT CEMENTABILITY**—because these plasticizers are non-migrating and non-volatile. (Of vital interest to any manufacturer of products requiring cemented construction.)

★ **STABILITY**—won't get brittle, won't evaporate.

★ **NON-MIGRATING**—won't soften or pick up varnish.

★ **EASY PROCESSING**—and a more perfect blend either on a mill or in a Banbury. Calenders and extrudes *smoothly*.

★ **HIGHER LOADING**—economy in products where the price per pound of the compound is important.

★ **WIDER LATITUDE**—in color and color stability, particularly with those hard-to-do pastels.

Our service bulletin, 48-H1, on the use of the new Hycar American Rubber with the vinyl resins, will be sent on request. We make no finished products from Hycar or any of our other raw materials, but we are glad to help in the development work on any special applications. Write Dept. HB-5, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

Hycar
Reg. U. S. Pat. Off.
American Rubber

B. F. Goodrich Chemical Company
A DIVISION OF THE B. F. GOODRICH COMPANY

GEON polyvinyl materials • HYCAR American rubber • KRISTON thermosetting resins • GOOD-RITE chemicals

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SPLICES WELL!

And they lived happily ever after!

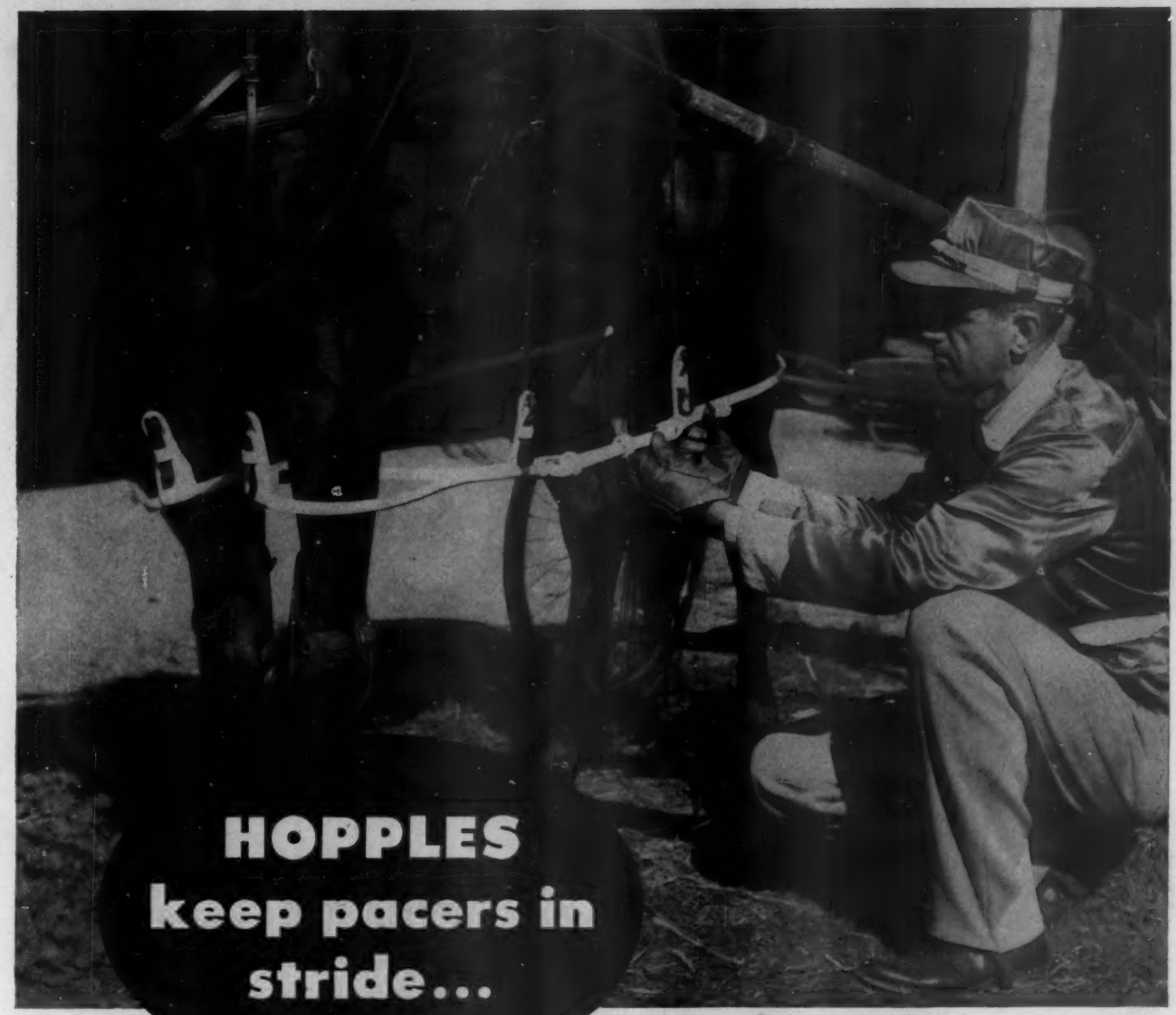
But that's only the happy ending of the story about the joining of rubber with Philblack A. All during the life of the product, Philblack A continues to give excellent resistance to abrasion and to cut and crack growth. And he has other good qualities! Philblack A provides high hot tensile . . . good heat and electrical conductivity . . . and superior resilience.

Try Philblack A in your rubber products and see how this HMF type black cuts processing time . . . helps in obtaining smooth extrusions . . . and removes the nerve from rubber. Yes, we think you're going to love Philblack A!

PHILLIPS PETROLEUM COMPANY

Rubber Chemicals Division

EVANS SAVINGS AND LOAN BUILDING · AKRON 8, OHIO



. . . and reveal a new use for GEON polyvinyl resins

IF you were driving a pacer you'd want him to wear a hopple.

And you would prefer a hopple made of Geon polyvinyl resins because, unlike leather, it would not pick up moisture as the horse sweats, "gumminess" would not pull the hair on the horse's leg—and you would probably never have to buy a replacement part.

Only a few thousand hopples will be made, for there aren't so many pacers. But many products can now have the same combination of practical properties the maker of hopples found when he went to Geon polyvinyl resins. He got high strength with light weight . . . resistance to oils and grease . . . ability to match owners' colors . . . long life and suppleness. He found, too, that this material can be wiped clean with a damp cloth, replacing laborious saddle-soaping.

Geon can be extruded, pressure or injection molded, used as a coating or impregnant, calendered or cast in sheets or film. We make no finished products from Geon—or from any of our other raw materials. However, we are glad to work on special problems or applications. We are particularly interested in developing new uses. For more information, please write Department R-5, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, O.

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GEON polyvinyl materials • HYCAR American rubber • KRISTON thermosetting resins • GOOD-RITE chemicals

Good-rite
VULTROL
for use in American rubber compounding
to prevent scorching, and for recovering
scorched stocks
GOOD-RITE AND VULTROL REG. T. M. U. S. PAT. OFF.

For technical data please write Dept. CB-5

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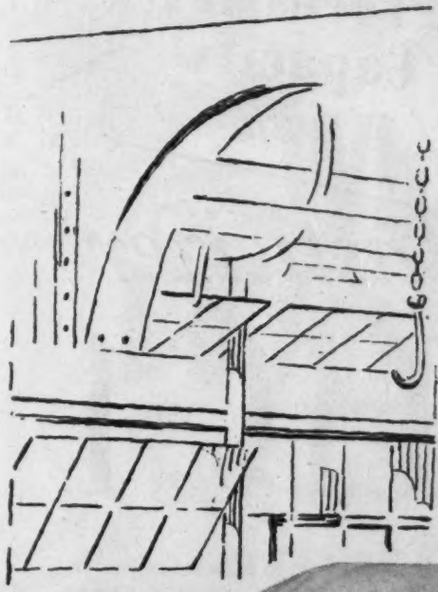
The Fabric in Fabrication Means More when it's a Mt. Vernon Fabric



Produced under rigid laboratory controls to a high degree of uniformity, Mt. Vernon fabrics assure easier fabrication—more uniform rubber products.

For fabrics that provide greater strength, more uniform penetration and resiliency — that make your production problems easier — that add quality to your products — specify Mt. Vernon.

uniformity makes the big difference

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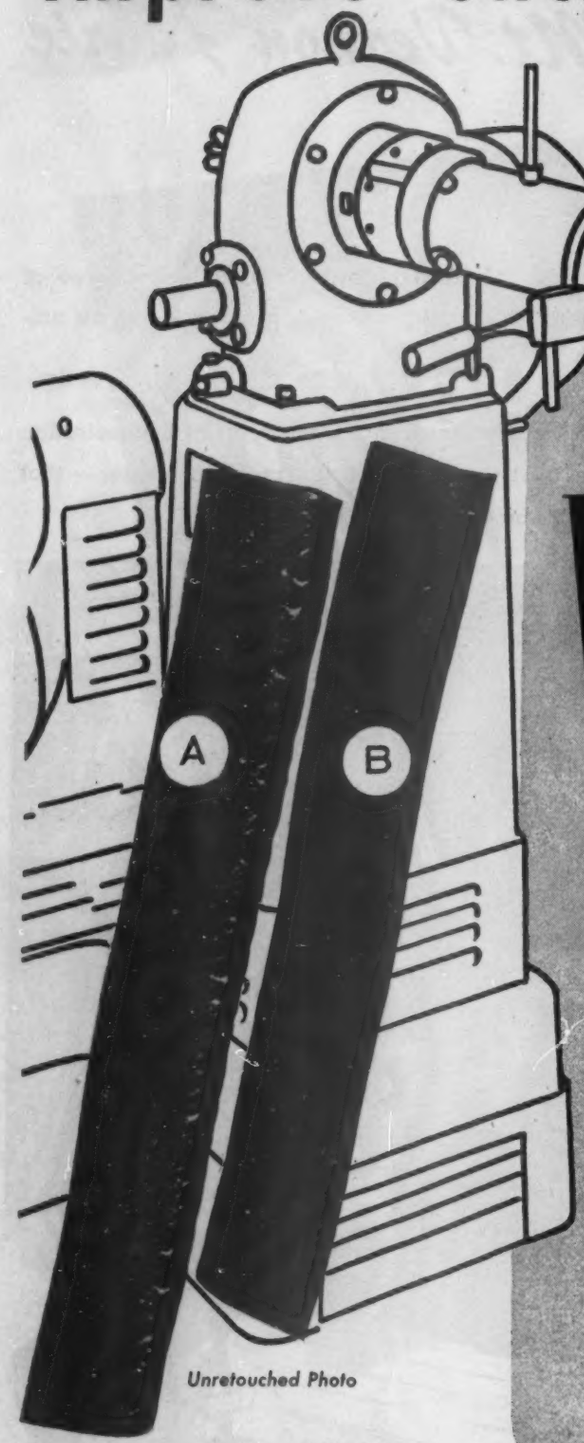
improve extrusions



Unretouched Photo

Increase Processing Capacity *with* *Plasticizer* VISTAC #1

You can depend on Vistac #1 to promote smoother extrusions. In illustration at left, note the graphic difference in the quality of extrusion between Compound A (plasticized with 10% petroleum type softener) and Compound B (plasticized with 10% Vistac). The pictures give visual proof of the effectiveness of Vistac #1.

And In Addition VISTAC #1

- Promotes finer finish — higher gloss
- Increases rate of extrusion, thereby increasing processing capacity
- Maintains dimensional stability
- Aids breakdown prior to extrusion
- Improves flex resistance
- Inhibits surface blooming
- Does not discolor white or light-colored stocks
- Improves serviceability of low-cost articles

Physical Properties

Specific Gravity	0.900
Pounds Per Gallon	7.5
Color	Almost Water-White
Saybolt Univ. Visc. (210°F.)	2800+ secs.

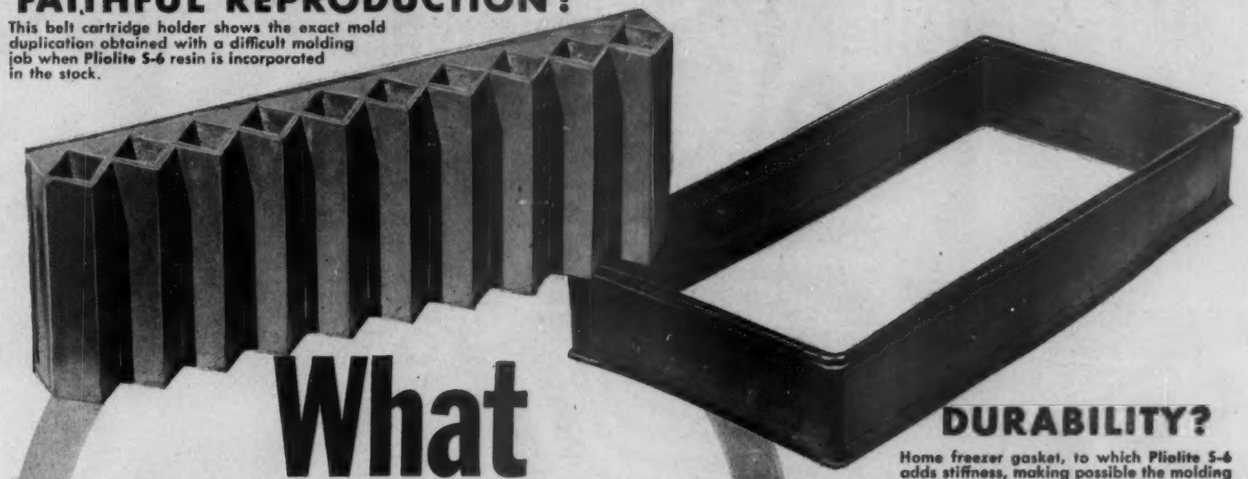
Write for our new booklet on the use of Vistac #1 in Natural Rubber and GR-S

Advance SOLVENTS & CHEMICAL CORP.

245 Fifth Avenue • New York 16, N. Y.

FAITHFUL REPRODUCTION?

This belt cartridge holder shows the exact mold duplication obtained with a difficult molding job when Pliolite S-6 resin is incorporated in the stock.



What Do You Need in a reinforcing agent?

DURABILITY?

Home freezer gasket, to which Pliolite S-6 adds stiffness, making possible the molding of the intricate undercut upper lip without detracting from the low-temperature characteristics desired.

PERFECT EXTRUSION?

An extruded refrigerator gasket, in which a smooth surface, as well as shape- and thickness-control, has been obtained by use of Pliolite S-6.

Illustrated here are just a few of the applications in which **Pliolite S-6** has shown marked superiority as a reinforcing agent.

Pliolite S-6 provides more easily handled compounds because it acts as a plasticizer at processing temperatures. Its reinforcement is positive—coupling extra hardness with negligible loss in elongation. Often elongation is increased. It increases flex-life, tear- and abrasion-resistance.

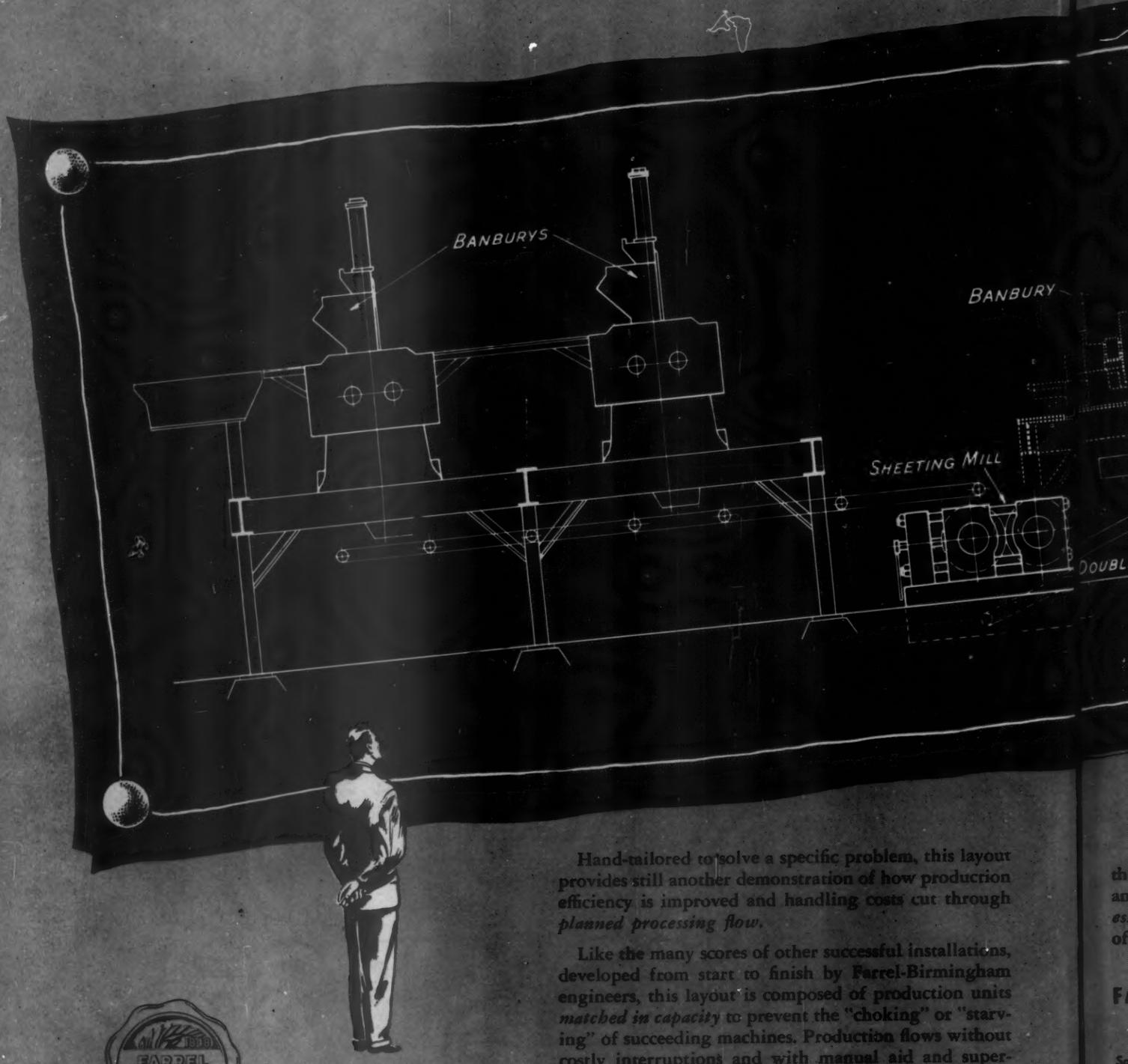
You will find **Pliolite S-6** to be ideally suited to all compounds needing a light-color low-gravity stock of 70-90 durometer hardness. It is effective with GR-S, Neoprene, Buna N and natural rubber. Available as a powder for your own mixing, or in master batches in whatever synthetic you select. For complete information and sample, write: Goodyear, Chemical Products Division, Plastics and Coatings Dept., Akron 16, Ohio.

PLIOLITE S6

Pliolite—T.M. The Goodyear Tire & Rubber Company

GOODYEAR

Here's another F/B demonstration of ENGINEERED PR



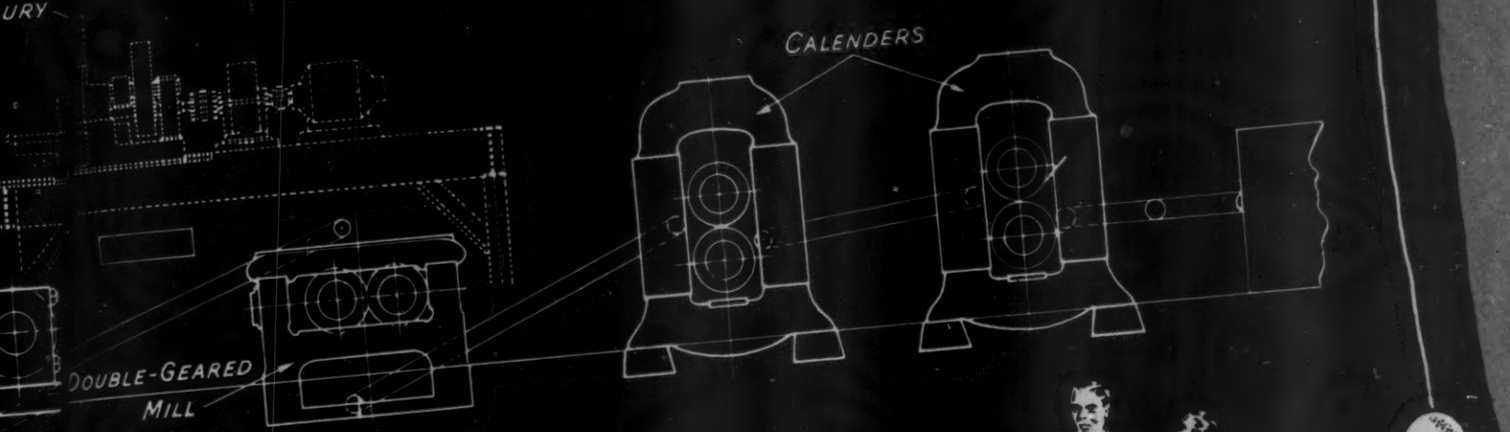
Hand-tailored to solve a specific problem, this layout provides still another demonstration of how production efficiency is improved and handling costs cut through *planned processing flow.*

Like the many scores of other successful installations, developed from start to finish by Farrel-Birmingham engineers, this layout is composed of production units *matched in capacity* to prevent the "choking" or "starving" of succeeding machines. Production flows without costly interruptions and with manual aid and supervision reduced to a minimum.

1848 FARREL CENTENNIAL 1948

RED PROCESSING FLOW

Schematic layout developed by Farrel-Birmingham engineers to synchronize production through the progressive steps in the manufacture of asphalt tile. The two Banburys discharge mixed stock onto a conveyor which carries it to the sheeting mill. The sheet, as well as the mottle chips from the third Banbury are automatically conveyed to the double-geared mill and then to the two calenders for reducing to finish gage.



Farrel-Birmingham engineers will be glad to discuss the possibility of improving your production efficiency and cutting your handling costs through *planned processing flow*. Why not call on them? No obligation, of course.

FB-445

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
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Banbury Mixers • Plasticators • Pelletizers • Mixing, Grinding, Warming and Sheeting Mills • Bale Cutters Tubing Machines • Refiners • Crackers • Washers • Calenders • Hose Machines • Hydraulic Presses • and other equipment for processing rubber and plastic materials.

Farrel-Birmingham

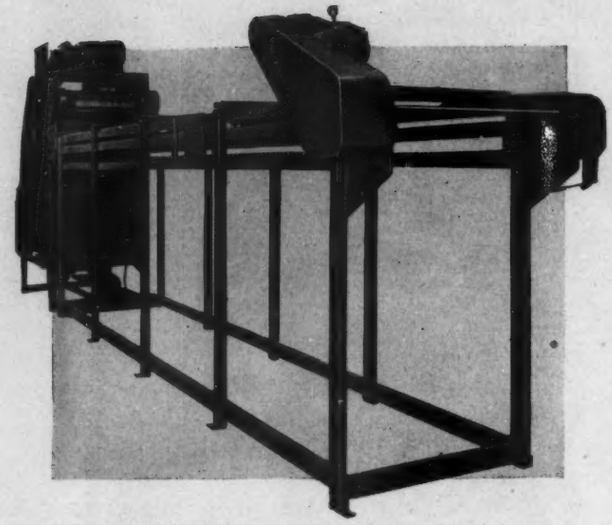
Cut your Banbury Cycle Time...

with this

AKRON-STANDARD AUTOMATIC MILL BATCH-OFF MACHINE

MILL END. *The Akron-Standard automatic batch-off machine ready to receive milled stock.*

Designed primarily to handle the mill output in connection with Banbury dump mills, this proven Akron-Standard machine distinctly shortens your Banbury cycle. It saves valuable mixing time by removing a continuous slab of stock from the mill in two minutes or less—*in a mere fraction of the time* you have heretofore needed to slab off the processed stock by hand. Your procssing cycle is reduced, your stock-handling definitely speeded up. How can you possibly afford to be without this remarkable time-saving Akron-Standard equipment?

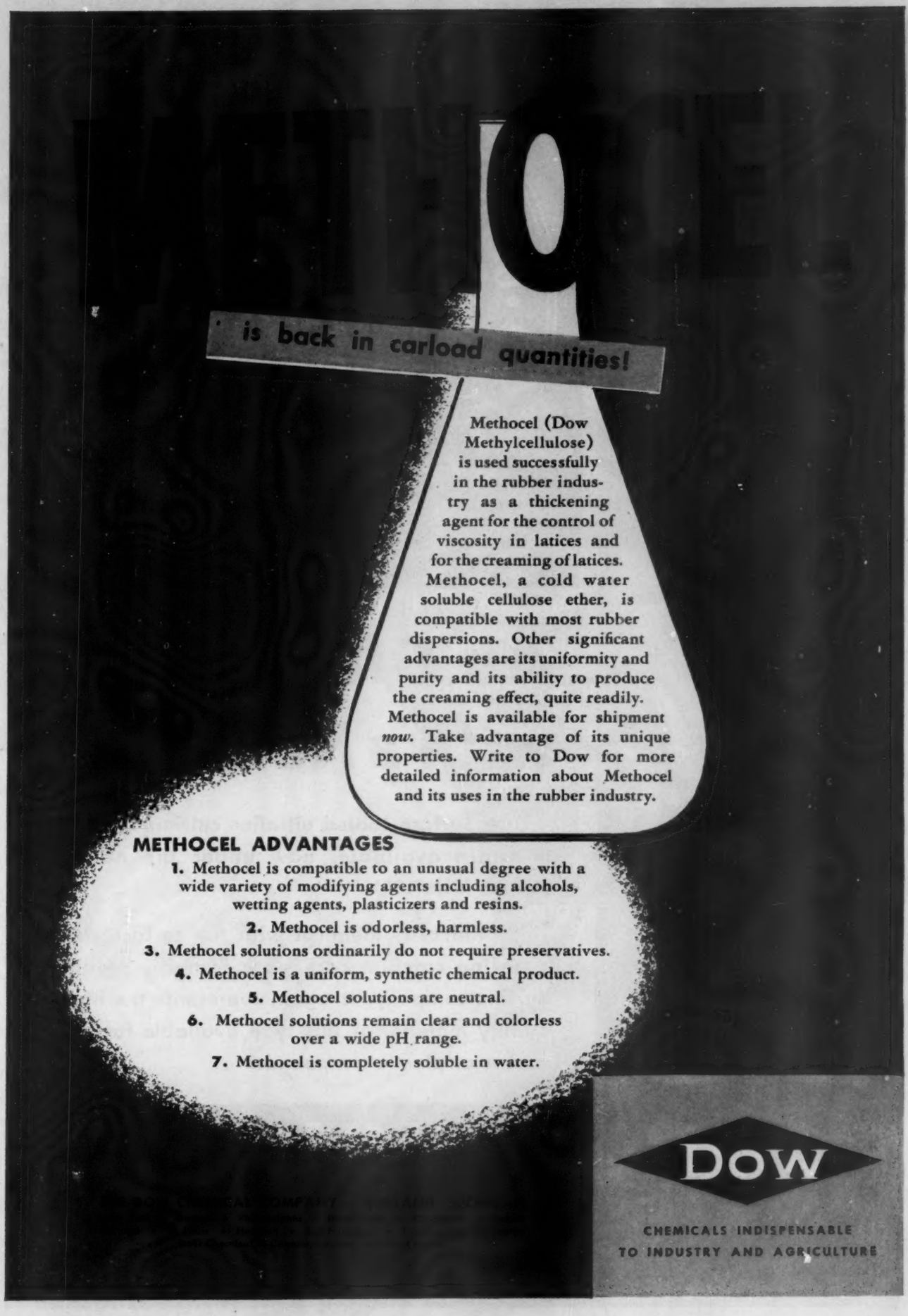


BATCH-OFF END. *Rack loading end and festoon rack in position to receive milled slab.*

Ask for our well illustrated 36-page Bulletin "A", describing this and many other types of profit-making Akron-Standard equipment.

The Akron Standard Mold Co.

1624 Englewood Avenue — *"The Established Measure of Value"* — Akron 5, Ohio, U. S. A.


is back in carload quantities!
Methocel (Dow Methylcellulose) is used successfully in the rubber industry as a thickening agent for the control of viscosity in latices and for the creaming of latices. Methocel, a cold water soluble cellulose ether, is compatible with most rubber dispersions. Other significant advantages are its uniformity and purity and its ability to produce the creaming effect, quite readily. Methocel is available for shipment *now*. Take advantage of its unique properties. Write to Dow for more detailed information about Methocel and its uses in the rubber industry.
METHOCEL ADVANTAGES
1. Methocel is compatible to an unusual degree with a wide variety of modifying agents including alcohols, wetting agents, plasticizers and resins.
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This product is identical with the surface coated ultrafine calcium carbonate formerly produced by this company. It again represents the highest quality material of this type available for use in rubber or plastic compounds.

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KALITE SWANSDOWN BRAND MULTIFEX SUSPENSO BRAND MILLICAL BRAND

Sterling S (SRF) *

These Cabot carbon blacks save tire compounders money. Sterling S in the Semi-Reinforcing range, and Sterling L in the High Modulus sphere, reduce inventories because of availability. More important still, Sterling S and L are made by the furnace process, and their low prices go a long way toward whittling down production costs.

Sterling L (HMF) **

*Semi-Reinforcing Furnace

**High Modulus Furnace

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Butaprene* NL is the Preferred Polymer in the MEDIUM ACRYLONITRILE GROUP

Here's Why:

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- ★ GOOD ELONGATION
- ★ FLEXIBILITY AT LOW TEMPERATURE
- ★ HIGH FUEL AND OIL RESISTANCE

No polymer in the 26% acrylonitrile group can equal Butaprene NL for easy processing. It handles perfectly on mills, calenders and extruders. But that's not all — you get good tensile, elongation and flexibility—all very necessary properties in a fuel-and-oil resistant elastomer.

No matter what your compounding problem, you'll find a Butaprene polymer for the job. The Butaprene technical staff will be glad to work with you on any problem involving oil - and - fuel - resistant elastomers in either latex or solid form. Simply write Xylos Rubber Company, Distributors, Akron 1, Ohio.

* Reg. U. S. Pat. Off.

BUTAPRENE* N by Firestone

AMERICA'S *most* VERSATILE ELASTOMER

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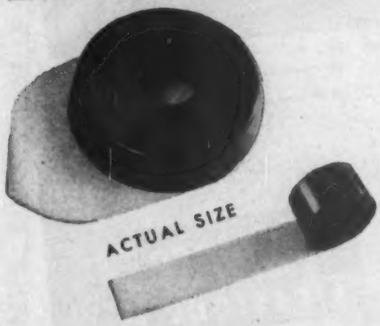
ALL-ROUND improvement for Hard and Semi-Hard Stocks

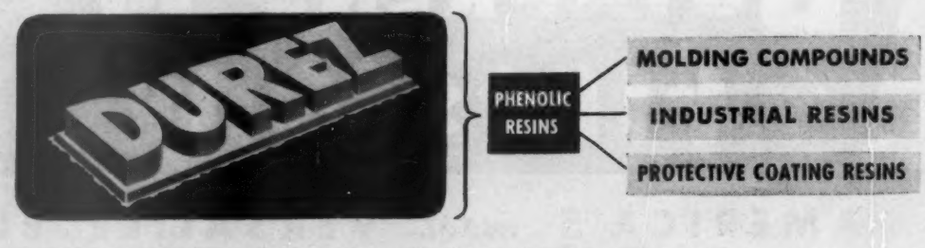
. . . with DUREZ Resins



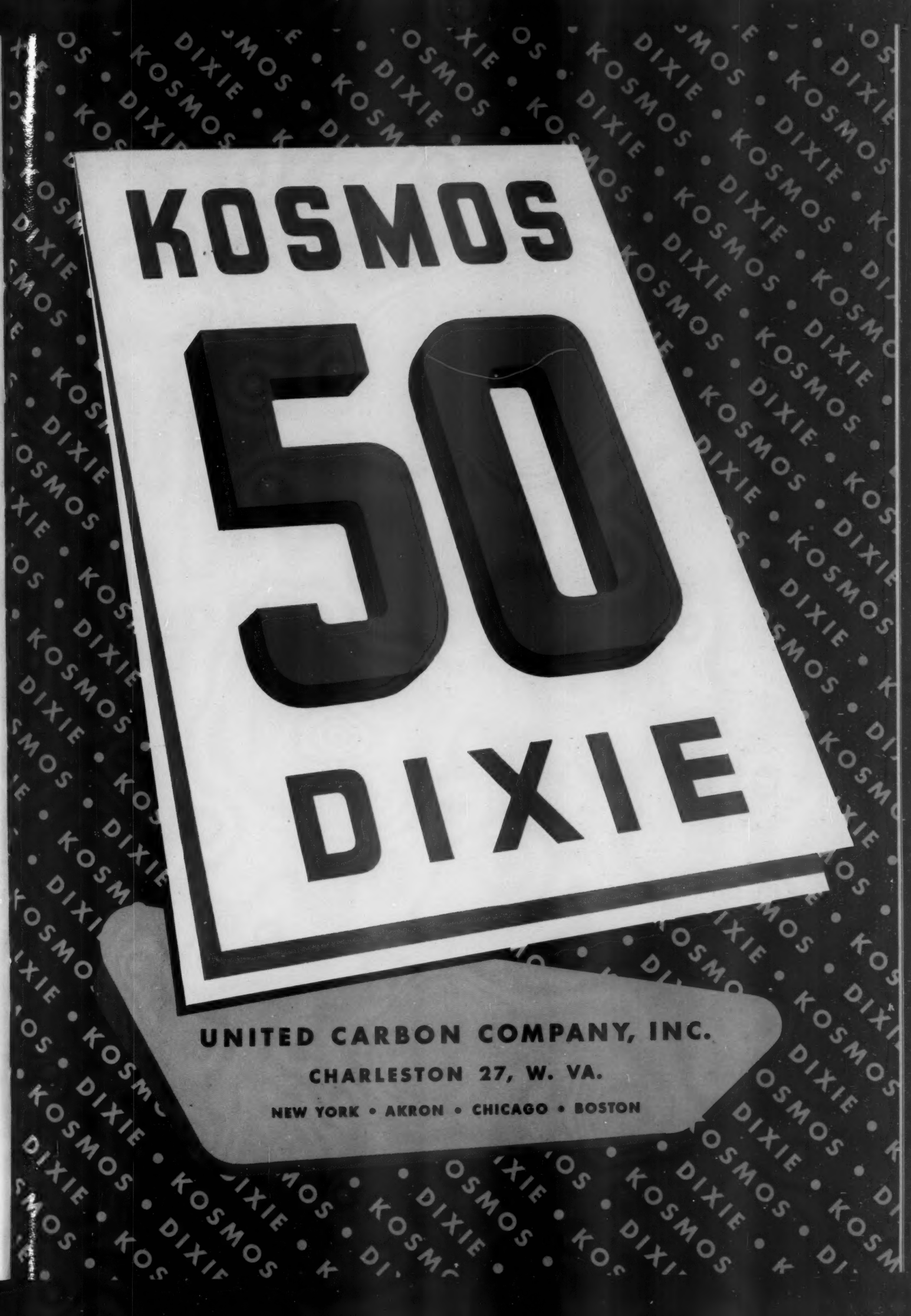
▲ *If you could find one ingredient that would have the following effects in your compounds, would you use it?*

- Improve mixing . . . by plasticizing and reducing nerve.
- Carry extra loading . . . by its fluidity when hot.
- Improve molding . . . by becoming plastic and then hardening.
- Reduce vulcanizing time . . . by its fast cure and vulcanizing effect.
- Increase hardness . . . by setting hard in itself.
- Increase stiffness . . . by its natural cured rigidity.
- Reinforce . . . by increasing tensile strength.
- Improve wear . . . by improving abrasion resistance.
- Resist higher temperatures . . . by its natural heat resistance.
- Improve chemical resistance . . . by its inherent solvent and chemical resistance.
- Produce glossy finish . . . by its natural high gloss.
- Improve weather resistance . . . by its resistance to water and oxidation.

● All these benefits at a minimum sacrifice of elongation and flexibility. This ingredient, with so many unbelievable advantages, is Durez 12687 Resin for Buna N Rubber and Durez 13355 Resin for GRS Rubber. Samples available to rubber manufacturers. Write for folder "Durez Resins in the Rubber Industry." Durez Plastics & Chemicals, Inc., 315 Walck Rd., N. Tonawanda, N. Y.



PHENOLIC RESINS THAT FIT THE JOB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a high modulus (HMF) furnace black characterized by structure and by a combination of most desirable properties for creating super-processing and high reinforcement.

DIXIE 50—KOSMOS 50 . . . . . .

is made by a new United process in specially designed furnaces from carefully selected fuel. Every step during its manufacture is under stringent control and the black is outstandingly uniform in quality.

KOSMOS 50—DIXIE 50 . . . . . .

is featured by ease of mixing, ready dispersion, fast extrusion, low shrinkage and finest appearance of stock. These are highly prized advantages.

DIXIE 50—KOSMOS 50 . . . . . .

is a quick curing black yielding high modulus and tensile, high resistance to tear, abrasion and flex cracking, and high resilience. It ages well.

KOSMOS 50—DIXIE 50 . . . . . .

Specify this black for tires, tubes, footwear, cable jackets and mechanical goods, and for blending with harder processing blacks.

Excel by using Kosmos 50—Dixie 50

RESEARCH DIVISION

UNITED CARBON COMPANY, INC.

Charleston 27, West Virginia

• PLASTICIZER SC is widely used in both rubber and synthetic resin compounding for high plasticizing action . . . It provides exceptionally desirable properties in countless finished products . . . Its application in compounds of various types makes it one of the most versatile of plasticizers — as well as the most effective in providing high plasticity quickly. It improves processing of stocks and cuts time on production . . .

PLASTICIZER SC is stable at high temperatures, and no volatilization or decomposition occurs on working at high operating temperatures . . . It is recommended for a wide range of products, including embossed surface products, soles and heels, fabric coatings, wire and cable insulation, tubing, unsupported films and aqueous dispersions.

Write for complete data and sample.

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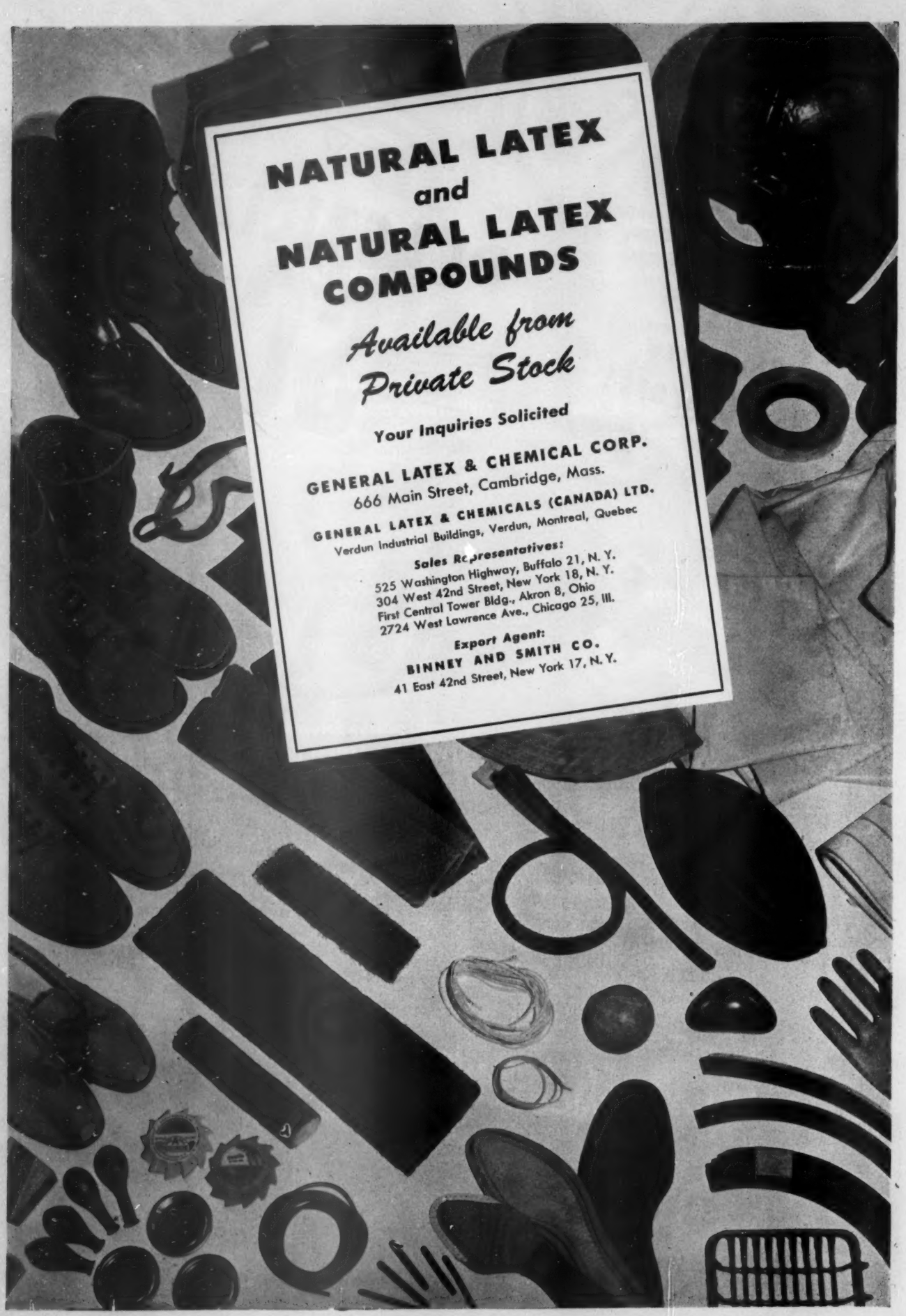
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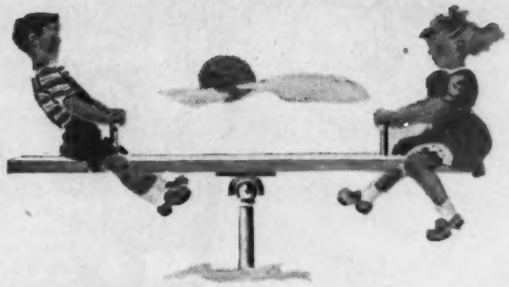
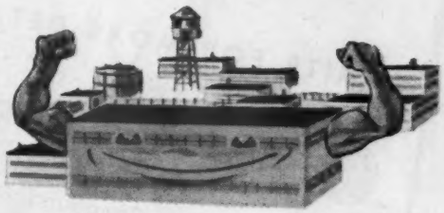


Greater Stability! A polyvinyl chloride-type resin of high molecular weight, Marvinol offers superior resistance to heat, light and other normally destructive factors.

MARVINOL® the new VINYL RESIN gives you all these advantages

Broad Temperature Range! Products made from Marvinol resins show less heat deformation than other resins . . . offer positive advantages in low temperature flexibility.

Unique Versatility! Easy to process, Marvinol resins may be calendered, extruded, injection molded, used in non-aqueous dispersions, formulated as unplasticized rigids. They're really versatile!



Ultra-Modern Plant! New Marvinol plant contains latest equipment to assure efficient operation, uniform product, highest quality. Production quantities of Marvinol resins are now available.

Close Cooperation! No division of The Glenn L. Martin Company compounds or fabricates in the plastics field. Let our sales engineers and modern customer service laboratory help solve your processing problems. Write on your company letterhead to: Chemicals Division, The Glenn L. Martin Company, Baltimore 3, Md.

Other Advantages to Cheer About! Can give crystal-clear transparency, brilliant or delicate colors... unusual "dryness" . . . exceptional toughness and long life . . . may be tasteless, odorless . . . easily, quickly cleaned.

Martin Marvinol

RESINS, PLASTICIZERS AND STABILIZERS PRODUCED BY THE CHEMICALS DIVISION OF
THE GLENN L. MARTIN COMPANY • AN INTERNATIONAL INSTITUTION
"BETTER PRODUCTS, GREATER PROGRESS, ARE MADE BY MARTIN"

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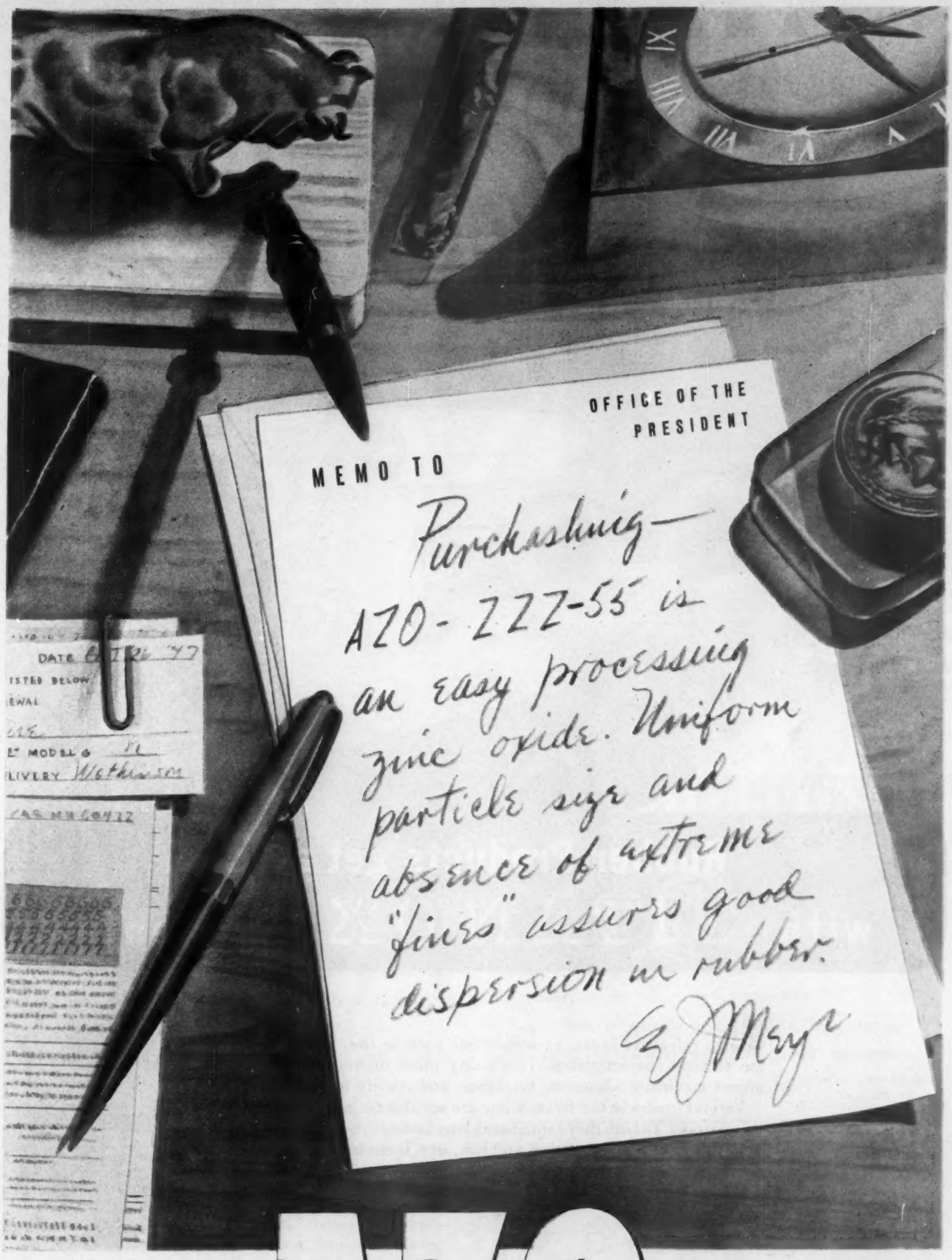
G-E SILICONE RUBBER • HEAT-RESISTANT GASKETS • G-E



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TITANOX . . . *the brightest name in titanium pigments*

Rubber Products get all 3 with TITANOX pigments

High refractive index, extremely fine particle size, and easy dispersion are TITANOX characteristics. That's why these titanium dioxide pigments impart maximum whiteness, brightness and opacity to all rubbers.

Various grades in the TITANOX line are suitable for natural as well as synthetic stocks. To both they contribute a long-lasting eye-appealing appearance.

If you have a pigmentation problem, our Technical Service Laboratory will be glad to help, as well as show you how to get the most from your available supply. Call our nearest office.

6526

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Their purity, fluffiness, fine texture, excellent dusting and lube qualities can contribute basic advantages to your products and processes.

Under Cyanamid's modern methods and production controls, each AERO BRAND STEARATE – Calcium . . . Zinc . . . Aluminum . . . Magnesium – is designed to give outstanding performance in the applications for which it is recommended.

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American Cyanamid Company

Industrial Chemicals Division

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Stymied by high material and labor costs?

NEW NRM TUBERS CAN CHANGE YOUR PROFIT PICTURE

Check your Equipment Against NRM's Modern Specifications
STANDARD SPECIFICATIONS
NRM HEAVY DUTY TUBERS
(8 Models—2" to 12" Production Sizes)
Heads—In all production sizes, cylinder adapter heads designed for water cooling are available.
Screws—Machine-finished on special NRM equipment from special, high grade forged steel. Flight surfaces hardened by exclusive NRM process to assure long life. Long rear extension holds screw in alignment.
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Drive Gear Units—Heat treated steel herringbone gears throughout. Heavy duty roller bearings. All gear housing joints oil tight. Self-lubricating system, eliminating force feeding. Flexible coupling.

TODAY'S high costs of both materials and labor make it doubly important for you to get the highest possible production efficiency through the use of modern equipment.

New NRM Tubers can bring you additional savings by the more economical use of electrical power; closer dimension control; more accurate control of stock processing temperatures; resulting in a better finished stock.

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Can You Use This Versatile, Economical Catalyst?

BORON FLUORIDE ETHERATE

Alkylated Phenols
Paints & Varnishes
Gums
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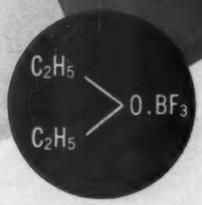

Boron Fluoride Etherate is an unusually versatile liquid catalyst, offering multiple advantages and economies for a wide range of reactions, including polymerization, alkylation, arylation, condensation, isomerization, esterification, cyclization. It combines the catalytic properties of BF_3 with the ease of handling and exact dispensability of a liquid. In operation after operation it has proved superior to many other catalysts because:

- Smaller quantities have greater catalytic activity.
- Little or no extraneous material is introduced into the system.
- Reactions are moderated or more easily controlled.
- Operating temperature ranges are wider.
- Yields are increased.
- Separations are easier and no bulky sludges are formed.
- Properties of end-products are improved.
- More reactions are carried to completion.
- Fewer undesirable waste materials result.

Boron Fluoride Etherate is available in 5-, 20- and 55-gallon drums for commercial applications as well as in one- and five-pound bottles for research purposes. For experimental samples and list of technical references on uses, etc., please make request on business letterhead.

OTHER BF_3 CATALYSTS: Fully equipped to handle gaseous BF_3 in producing its compounds with other complex-forming chemicals, Baker & Adamson is ready to work with you in the development of BF_3 catalysts to meet your specifications. This is of special significance since BF_3 can often be coordinated with products entering into the reactions in which it is the active catalyst.

Possible Uses of BORON FLUORIDE Etherate as Catalyst for:

1 Polymerization and co-polymerization of mixed unsaturates.

2 Selective esterification of mixtures of organic acids.

3 Cyclization of synthetic and natural elastomers after polymerization or in starting from monomers.

4 Condensation of modified phenolics.

5 Preparation of alkyl phenols.

6 Refining of aromatic and paraffinic solvents by polymerization of the olefins they contain.

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8 Modification of mixtures of esters and acids by polymerizing conjugated compounds selectively.

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AQUAZINC is particularly convenient for surface application of Zinc Stearate. When diluted with 8 to 20 parts of water, it can be applied by spray or bath.

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Chemical Manufacturers
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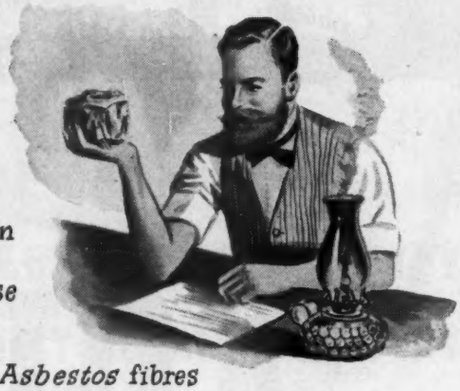
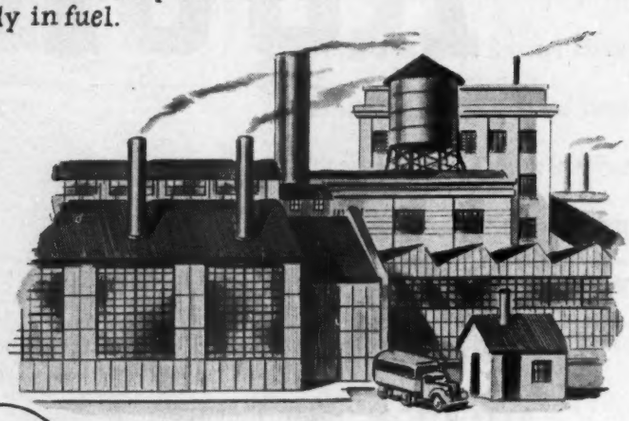
In Canada: PRESCOTT & CO., REG'D., 774 ST. PAUL ST. W., MONTREAL

1873 – Henry G. Keasbey and Richard V. Mattison open a modest drug manufacturing business in Philadelphia. Basic ingredient: Magnesium Carbonate.



In his spare time, Dr. Mattison experiments with a fire-defying fibre called *Asbestos*... seeking ways to use it for the benefit of humanity.

1886-reward! By blending *Asbestos* fibres with basic Magnesium Carbonate, he develops 85% Magnesia Pipe Insulation which today saves Industry millions of dollars annually in fuel.



Further K&M research soon yields America's first *Asbestos* textiles in commercial quantities, America's first *Asbestos*-cement roofing shingles, and the first *Asbestos* Corrugated Sheets.

1948 – what started as a small drug business is today a leading factor in America's giant and strategic *Asbestos* Industry!

This year marks the 75th anniversary of the founding of Keasbey & Mattison Company—the pharmaceutical firm that branched out into one of America's primary producers of Asbestos and Magnesia products.

Today, K&M "Featherweight" 85% Magnesia insulation is still one of the Company's basic products. But in addition, K&M also makes a complete line of asbestos-cement materials including shingles, pipe for water mains, corrugated and flat lumber, sheet packings, paper and millboard, textiles.

In celebration of the anniversary, K&M has prepared a brief, interesting history of the Company. We will be glad to send you a copy with our compliments.

DIAMOND ANNIVERSARY 1873 K&M 1948 KEASBEY & MATTISON CO.

Nature made Asbestos . . .
Keasbey & Mattison has made it serve mankind since 1873

KEASBEY & MATTISON
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ASK ANYONE WHO KNOWS . . .

R. D. WOOD HYDRAULIC PRESSES will fit *your* purpose!

Performance for others in the Rubber Processing Field has proven it.

To know the features of R. D. Wood Hydraulic Presses is knowledge enough to have their operation and integral quality perform economically for you. For in any R. D. Wood Press there is rugged construction, ease of operation, and low maintenance, all wrapped in top quality.

R. D. Wood Presses *do* excel in actual performance . . . from the small laboratory press to the large vulcanizing and curing press . . . they have shown their worth to the Rubber Industry by constant, efficient, economical service.

Now, available to you is technical information . . . ask for it and be in on the "know" about the line of R. D. Wood Presses.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • ALLEVIATORS • INTENSIFIERS

EST. 1803

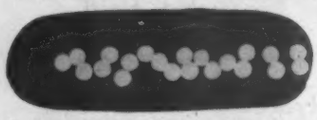
R. D. Wood Company

PUBLIC LEDGER BUILDING, PHILADELPHIA 5, PA.

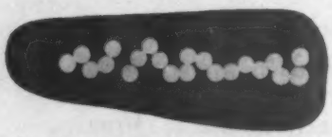
HOW THIS HEAD GETS RID OF HEADACHES...

in insulating tire bead wire

Enlarged section of insulated wire braid showing balanced coverage more consistently maintained with Frazier-type head.



Typical off-balance due to stock surge which forces wire to one side of die. Thin rubber film is easily broken or removed in subsequent operations.



Excessive coverage at one edge, a result of uneven die wear caused mainly by stock surge, results in unbalanced bead.

IN addition to producing wire for tires and other rubber products, National-Standard Co. for years has built bead wire insulating heads, dies and baffles for the rubber industry. Thus, complete familiarity with wire insulating problems has led to the development of National-Standard's new Frazier-type head, designed to correct the most troublesome shortcomings of conventional equipment. Here's how:

1. *The new-type head divides the stock, sandwiches the wires, lessens surge, and allows the wires to pass through the die and baffle with the least amount of disturbance.*
2. *As a result there is better control and more uniform coverage, relieving the possibility of separation due to wire exposure.*
3. *In turn, better coverage and relief of surge reduces wear on die and baffle. Thus die life is often doubled.*

The new Frazier-type head offers still other advantages. These, together with details of construction, application, available dies and baffles, etc., are shown and described in a new catalog. A copy is yours for the asking. *National-Standard Company, Niles, Michigan.*

NS
NATIONAL-STANDARD Company
NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL	*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD	*Niles, Mich.*	Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Lithographing and Special Machinery
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round Steel Wire, Small Sizes

Join the parade to lower-cost rubber compounding

INDONEX

Reg. U. S. Pat. Off.

PLASTICIZERS

Send for any of these Bulletins

General results obtainable with INDONEX in natural and synthetic rubbers have been described in our Bulletin No. 13, while various other specific applications of INDONEX are discussed in the following circulars. Check the circulars you want, clip the list to your letterhead, and mail.

☐ **13-1—Butyl Rubber Compounds** ☐ **13-2—Butadiene-Acrylonitrile Copolymer Compounds** ☐ **13-3—Neoprene Compounds** ☐ **13-4—Tire Carcass Compounds** ☐ **13-5—Footwear and Heel Compounds** ☐ **13-6—Camel Back** ☐ **13-7—Motor Mount and Bumper Compounds** ☐ **13-8—Wire Jacket and other Extruded Compounds** ☐ **13-9—GR-S Packing Compounds** ☐ **13-10—Hose Compounds** ☐ **13-11—Hard Rubber Compounds** ☐ **13-12—Low Hardness Mechanical Goods** ☐ **13-13—Neoprene Mechanical Goods** ☐ **13-14—Hycar OR-15** ☐ **13-15—Natural Rubber—Reclaim Mechanical Goods and Carcass Compounds** ☐ **13-16—Hard Rubber Compounds** ☐ **13-18—Masterbatch Addition to Natural Rubber Compounds** ☐ **13-19—Various Fillers in Reclaim Stocks** ☐ **13-20—Selection of INDONEX-Accelerator Combinations.**

INDOIL®
CHEMICAL PRODUCTS

STANDARD OIL COMPANY (INDIANA)

Chemical Products Department

910 South Michigan Avenue **Chicago 80, Illinois**

PROTOX—

the Surface-Treated Zinc Oxide for Rubber that Speeds Production, Improves Quality and SAVES Money

SEVERAL years of research and development in the laboratory and pilot plant indicated that propionic acid treated* Zinc Oxide had several properties particularly desired by compounders of rubber.

From 1941 to 1946, World War II prevented wide introduction of this material.

Since 1946, this Zinc Oxide—until now known as XX-166—has been subjected to large scale plant tests in a variety of compounds. The fact that it speeds production, improves quality, and saves money has led to its adoption by a number of manufacturers.

Now this pigment takes its place in the regular line of New Jersey Zinc quality Zinc Oxides—but under a new name, PROTOX-166. We believe that on its merits PROTOX-166 will soon become one of the most widely used Zinc Oxides in the rubber industry.

**U. S. Patents 2,303,329 and 2,303,330.*

THE NEW JERSEY ZINC COMPANY

160 FRONT STREET • NEW YORK 7, N. Y.

Products Distributed by THE NEW JERSEY ZINC SALES COMPANY

NEW YORK • CHICAGO • BOSTON • CLEVELAND • SAN FRANCISCO • LOS ANGELES

DOUBLE-CHECKED ✓ CHEMICALS FOR THE RUBBER INDUSTRY

SHARPLES ACCELERATOR

66-1

SELENIUM DIETHYL DITHIOCARBAMATE

PRIMARY ACCELERATOR

SECONDARY ACCELERATOR

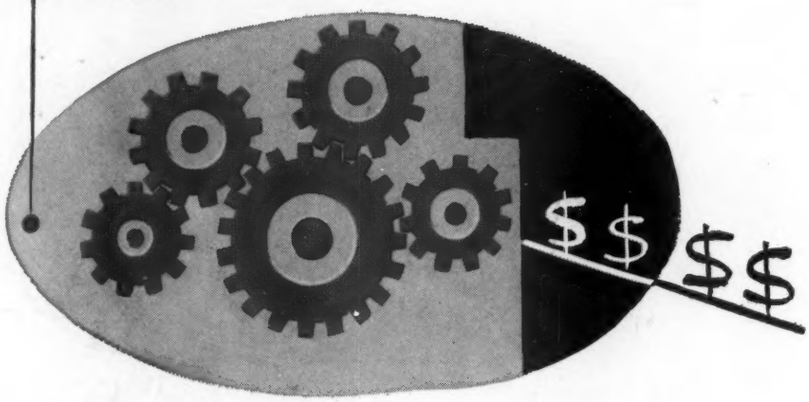
VULCANIZING AGENT

SHARPLES TRADE MARK CHEMICALS

SHARPLES CHEMICALS INC. PHILADELPHIA • NEW YORK • CHICAGO • AKRON

WANTED CORPORATION PRESIDENTS

to start the machine that manufactures SECURITY



This machine operates best when started by top management! It's the ***Payroll Savings Plan*** for the regular purchase of U. S. Security Bonds. It produces security for individuals, for business, and for the nation at large.

Security for individuals . . . because every $3 invested in Security Bonds pay $4 at maturity.

Security for business . . . because the billions of dollars already invested—and being invested—in Bonds are building future purchasing power.

Security for the nation . . . because every Bond dollar that is built up in the Treasury is used to retire a dollar of the national debt that is potentially inflationary, and because every Bond held means fewer dollars to go to market to bid up prices on scarce goods.

Produces Other Benefits, Too!

In 19,000 industrial concerns operating the Payroll Savings Plan, employees are more contented. Worker production has increased, absenteeism has decreased—even accidents have been fewer!

Why Should Top Management "Press the Button"?

Begun in war-time, the Payroll Savings Plan was rapidly and widely adopted under the stimulus of dramatic patriotic appeals.

Those appeals are gone. Yet the reasons for investing in Security Bonds today are important. Management men can understand these reasons—and have the influential authority that's needed to "start the machine". . . to get the Plan vigorously promoted.

Your Task Is Easy—and Vital!

To enable you to install or to reinvigorate the Plan in your company, with minimum time and effort, the Treasury Department has prepared a kit of materials especially for you to distribute among specific key personnel. Be sure to get and use your kit! Your sponsorship of the Plan will bring you its greatest benefits in your own company—and you'll be doing your part to help guarantee America's security—***which is your best business security.*** For help, call your Treasury Department's State Director, Savings Bonds Division.

The Treasury Department acknowledges with appreciation the publication of this message by

RUBBER AGE

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council.

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MBT (MERCAPTOBENZOTHIAZOLE)

Ton lots . . . . . 27¢ per lb.
Less than ton lots . . . . . 29¢ per lb.

MBTS (BENZOTHIAZYLDISULFIDE)

Ton lots . . . . . 35¢ per lb.
Less than ton lots . . . . . 37¢ per lb.

Add 1 cent per lb. for West Coast.
Shipments FOB, Bound Brook. Freight allowed.
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AMERICAN CYANAMID COMPANY

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Rubber-Flo

WILL KEEP YOUR MOLDS

AS CLEAN AS ...A WHISTLE

RUBBER-FLO is SAFE! It is a non-toxic odorless mold lubricant.

RUBBER-FLO is QUICK! It may be sprayed, brushed or dripped onto the mold. It will not clog a spray gun.

RUBBER-FLO is ECONOMICAL! The savings in maintenance more than pay for it.

RUBBER-FLO is LOW IN COST! It comes in concentrated form and is diluted with water for use.

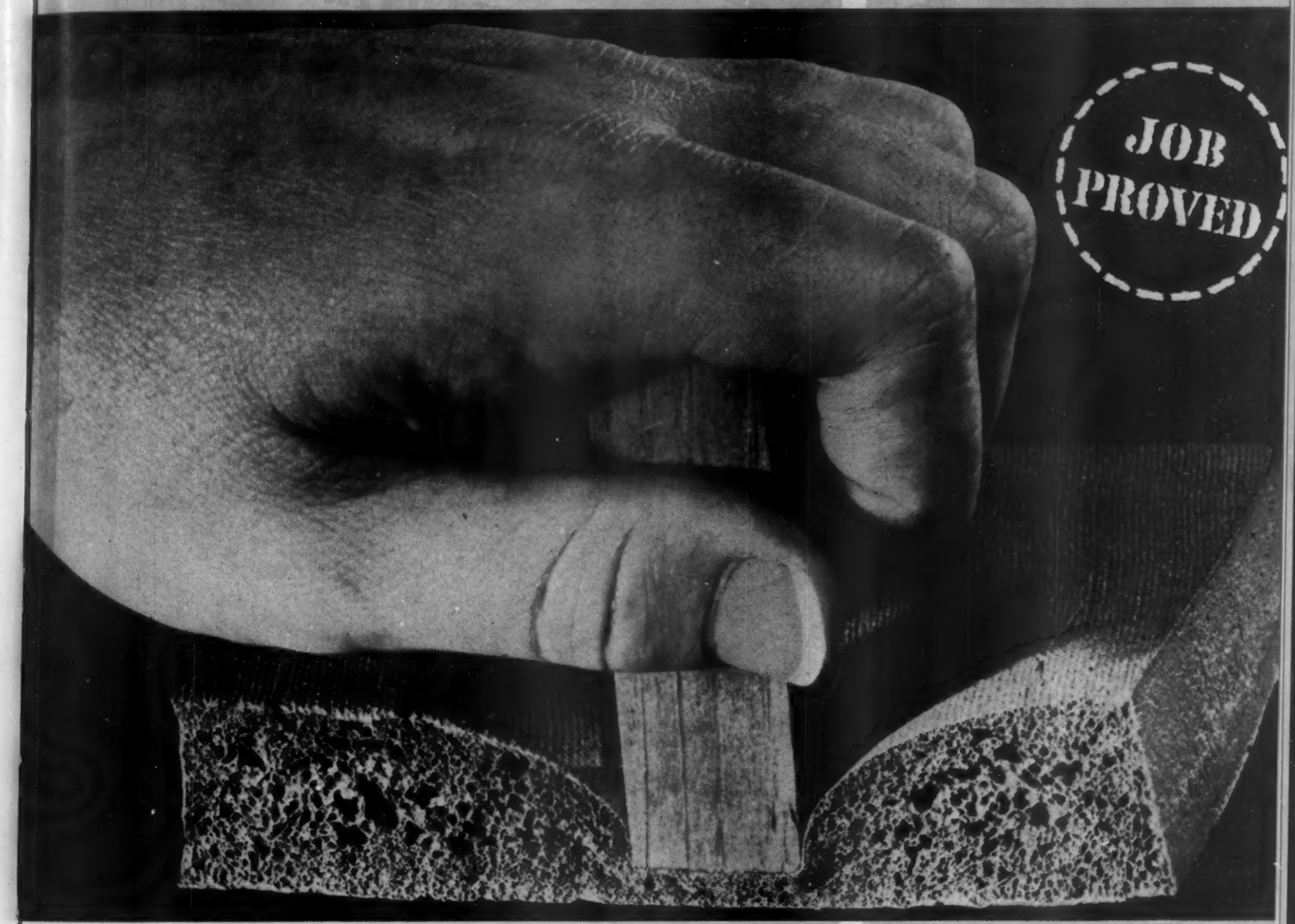
Rubber manufacturers of diverse lines, such as Mechanical Rubber Goods, Soles and Heels, Sponge Rubber Products, Drug Sundries, Tires and Tubes have found that RUBBER-FLO MOLD LUBRICANT increases production and reduces maintenance.

Write today for your FREE SAMPLE and for further information.

PREVENTIVE MAINTENANCE CO.

1997 FAIRFIELD AVENUE
Bridgeport, Connecticut

Cuts Migration Troubles In GR-S Sponge



CIRCOSOL-2XH . . .

Used by Leading Manufacturers of Sponge Rubber

"Our chief reason for using Circosol-2XH," says the research director of a prominent manufacturer of rubber sponge, "is that it is less migratory."

This Company uses Circosol-2XH in processing sponge rubber which is later cemented in place with the common reclaim rosin-type adhesives.

After testing Circosol-2XH they found it softened the rubber satisfactorily and did not migrate, "bloom" or affect the cement as ordinary processing oils did. Circosol-2XH gives them a margin of safety in manufacturing and helps to make possible higher production and more satisfactory application.

Circosol-2XH is a processing aid, refined by Sun as an elasticator for GR-S. It is widely used throughout the industry to speed up processing and to increase the resiliency of finished GR-S products. For complete information on Circosol-2XH and other "Job Proved" Sun processing aids for rubber, write Department RA-5.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***
In Canada: Sun Oil Company, Ltd.—Toronto and Montreal

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INDUSTRIAL PRODUCTS

ST. JOE Lead-Free ZINC OXIDE
PRODUCT CONTROL
A vital factor in the manufacture of quality Zn O
ORE, AIR, WATER, DRILL and Skill
...Essential Production Tools in the Manufacture of ZnO
FOR AN IMPORTANT PRODUCTION
ST. JOE lead-free ZINC OXIDES
... MADE BY A PATENTED ELECTRO-THERMIC PROCESS ...
why
THE FLEXIBILITY OF THE PROCESS IS VALUABLE TO CONSUMERS
ST. JOSEPH LEAD COMPANY
250 PARK AVENUE NEW YORK 17
PLANT AND LABORATORY, JOSEPHTOWN, BEAVER COUNTY, PENNSYLVANIA

A MESSAGE TO ZINC OXIDE CONSUMERS

REPRODUCED here in miniature are a few of our Zinc Oxide advertisements which appeared in various trade publications during the past two years. The purpose of the series, of which these advertisements are a part, was to show consumers the most important phases in the production of our product. While the greater portion of the zinc concentrates used to make St. Joe Zinc Oxides originates in our own mines in Northern New York State, substantial quantities of ores are purchased in Canada and other countries so that our plant may be operated to the greatest capacity to meet the unprecedented demand.

Nevertheless, current production still falls short of the tonnages needed. However, additional plant facilities are now under construction which will soon make possible an increased production to better satisfy the requirements of our valued customers for ST. JOE Lead-Free ZINC OXIDES.

ST. JOSEPH LEAD COMPANY

250 PARK AVENUE • NEW YORK 17 • ELdorado 5-3200

Plant & Laboratory: Josephtown, Beaver County, Pennsylvania

PARA-FLUX

QUALITY IS ALWAYS THE SAME

BY THE TANK CAR

OR BY THE DRUM

For 26 years PARA FLUX has been the Standard of the Rubber Industry, its quality is always the same whether you are a drum or tank car user.

The **C.P. Hall Co.**
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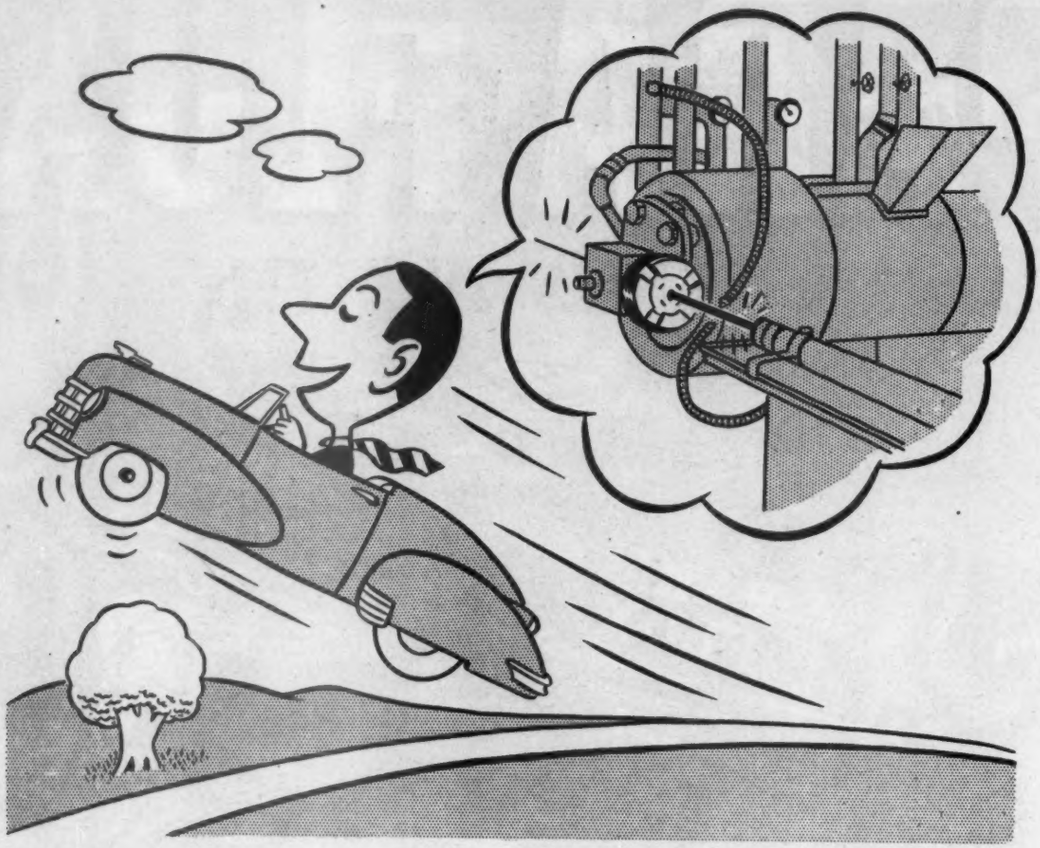

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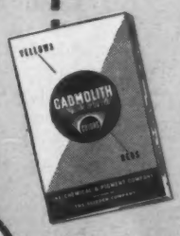

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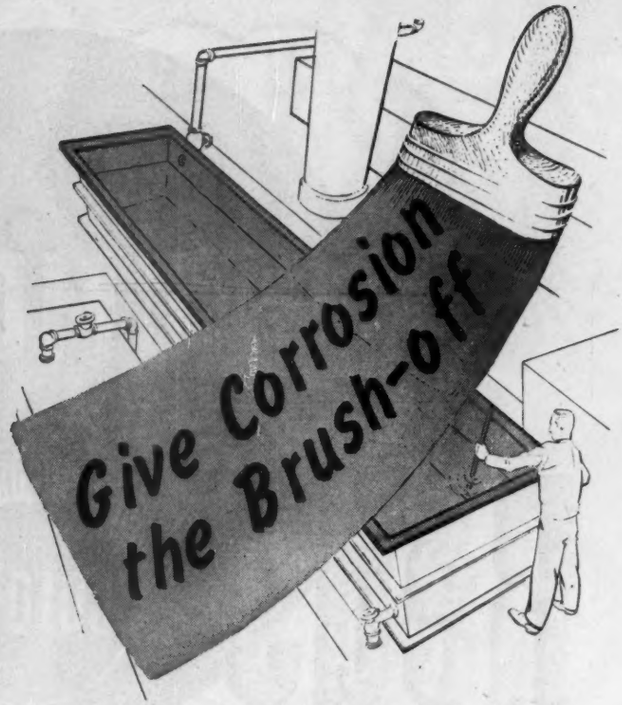

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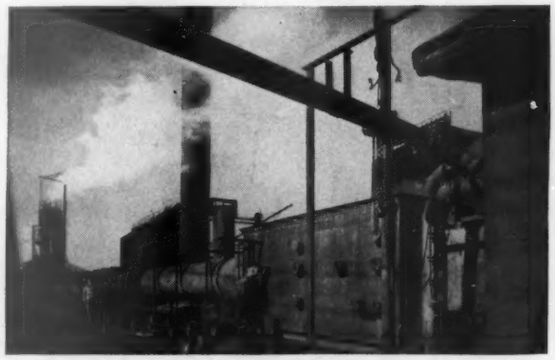

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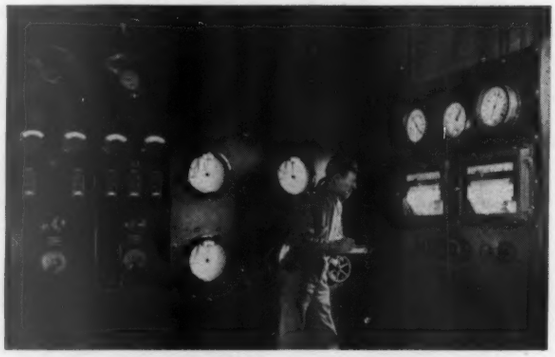

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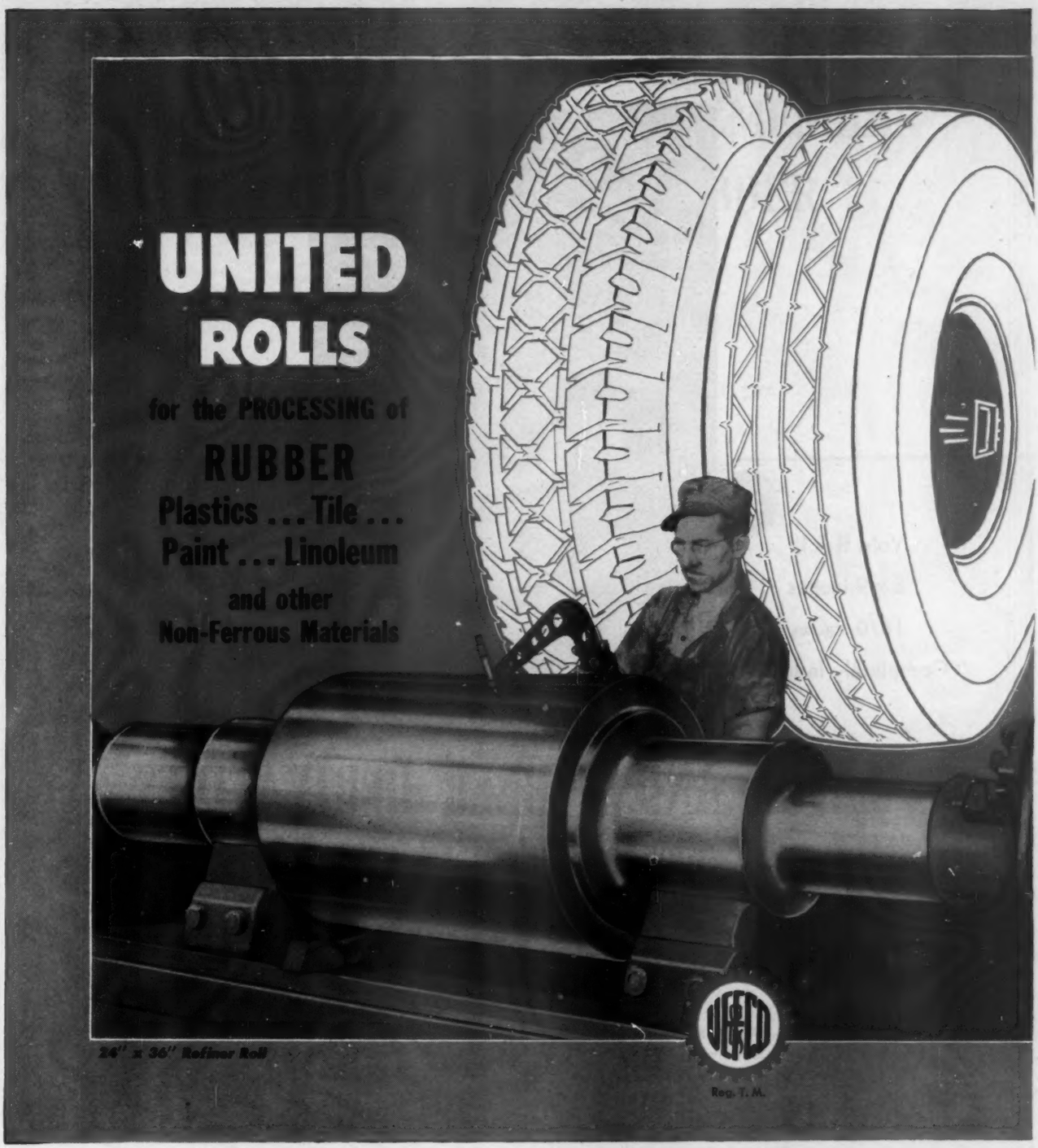

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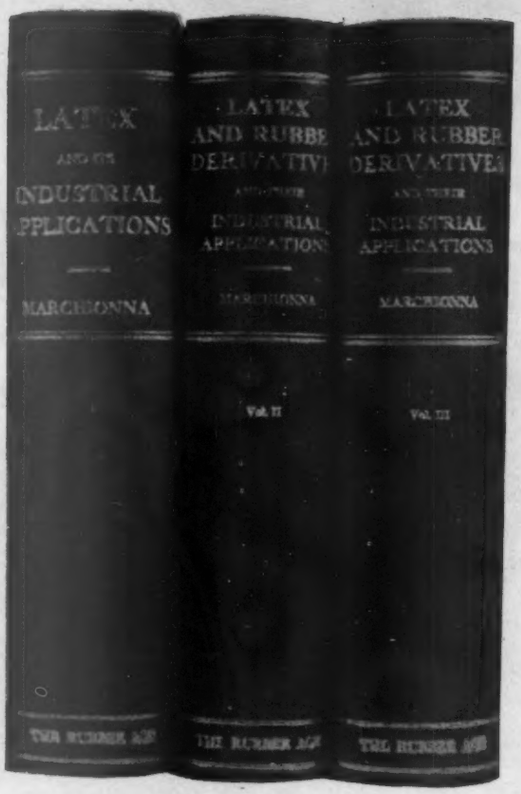

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RUBBER AGE

Vol. 63, No. 2 MAY, 1948

Typical Visible Defects Found in Various Types of Rubber Hose

By THEODORE A. WERKENTHIN

Principal Materials Engineer, Bureau of Ships, Navy Department, Washington, D. C.

THE "natural rubber famine" during the war years brought home to us the necessity of utilizing the available rubber to the maximum extent possible. An effective means of accomplishing this was to reduce the quantity of defective material in any lot of manufactured item to a minimum by improving the manufacturing processes and by education and training of the factory workers. This phase of the program was, of course, primarily the duty of the rubber manufacturer. However, the consumer could also help in the maximum utilization of rubber by making sure that all usable material was passed on inspection.

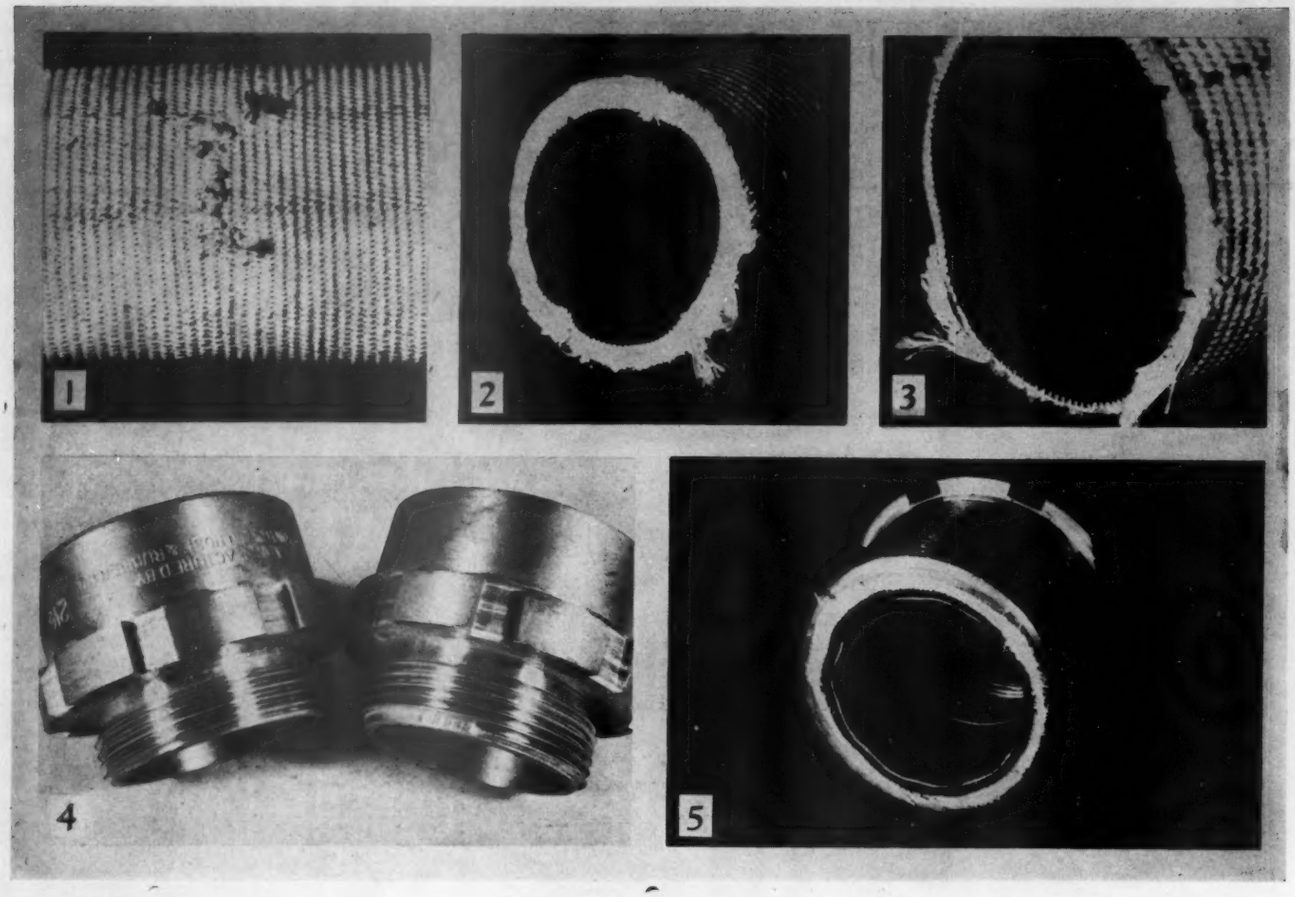
To keep up with the enormous requirements of the war often necessitated acceptance of material, especially mandrel-made hose, that was not visually perfect. Since the various Naval inspectors were not always trained rubber technologists, Bureau personnel frequently had to act as final arbiters in cases in which the inspector was doubtful whether the defect was a minor one or whether it would affect the serviceability of the hose. It was, of course, of paramount importance that the serviceability of the hose was not in any sense impaired by accepting material having minor visual defects.

In order to be fair and equitable to all manufacturers, it was desirable that standards of acceptance of hose quality be set up so that we would not accept one lot of "off-quality" hose in Passaic and turn down a lot of similar quality hose offered for delivery in San Francisco. In one case the inspector might have felt that the visual defect would not have any influence on the serviceability whereas the other inspector might not realize that, although the hose was not as attractive as by standard requirement, it would still serve its purpose in every sense.

Of course, there were exceptions to the equality of acceptance or rejection. The author recalls an instance where a watchful WAVE inspector rejected fuel hose because the inside of the hose was not clean when tested with a piece of facial tissue. Acceptance was not made until after the hose had been duly steamed out and blown dry with air. This effectively removed the outer coating of the antioxidant and talc which would otherwise have protected the rubber surface from oxidation; but according to her interpretation of cleanliness, it was now acceptable and in conformity with the specification. Nobody should gain from this anecdote the impression that women were not good inspectors. Far from it. Some of our best inspectors were women—both civilian and WAVES.

The introduction of statistical sampling procedures in Bureau of Ships specifications during the early war years did much to equalize acceptance of material of a certain quality and to smooth the path for plant and

Note: The opinions or assertions contained herein are the private ones of the author and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.



Cotton Jacketed Hose—Major Defect

(1) Defect in weave of yarn and jacket. (2) Ridge on the rubber lining results when the inner jacket is too large for the outer jacket. (3) Bunching of the rubber lining. (4) Higbee thread in coupling is not full cut; a "full cut" Higbee thread is shown for comparison. (5) Defect caused by the expansion ring failing to extend over the rubber gasket.

Naval inspectors. Commander Joseph H. Christoph of the Statistical Section of the Bureau of Ships, in collaboration with the author, initiated a plan for collecting samples of hose having varying degrees of visual imperfections in order that they might be classified as to effect on suitability.

Personnel of the rubber manufacturers' plants, as well as Naval inspectors, collected large numbers of samples of hose showing all types of defects which might be experienced in everyday manufacture. These defects result either from failure of the mechanical equipment to operate properly, or to failure of the operator to place each of the constituent parts in its proper position. Other hose failures were not the result of temporary dislocation of machinery, but resulted from imperfections in the textile, in the rubber compounds, or in the reinforcing wires used in hose manufacture.

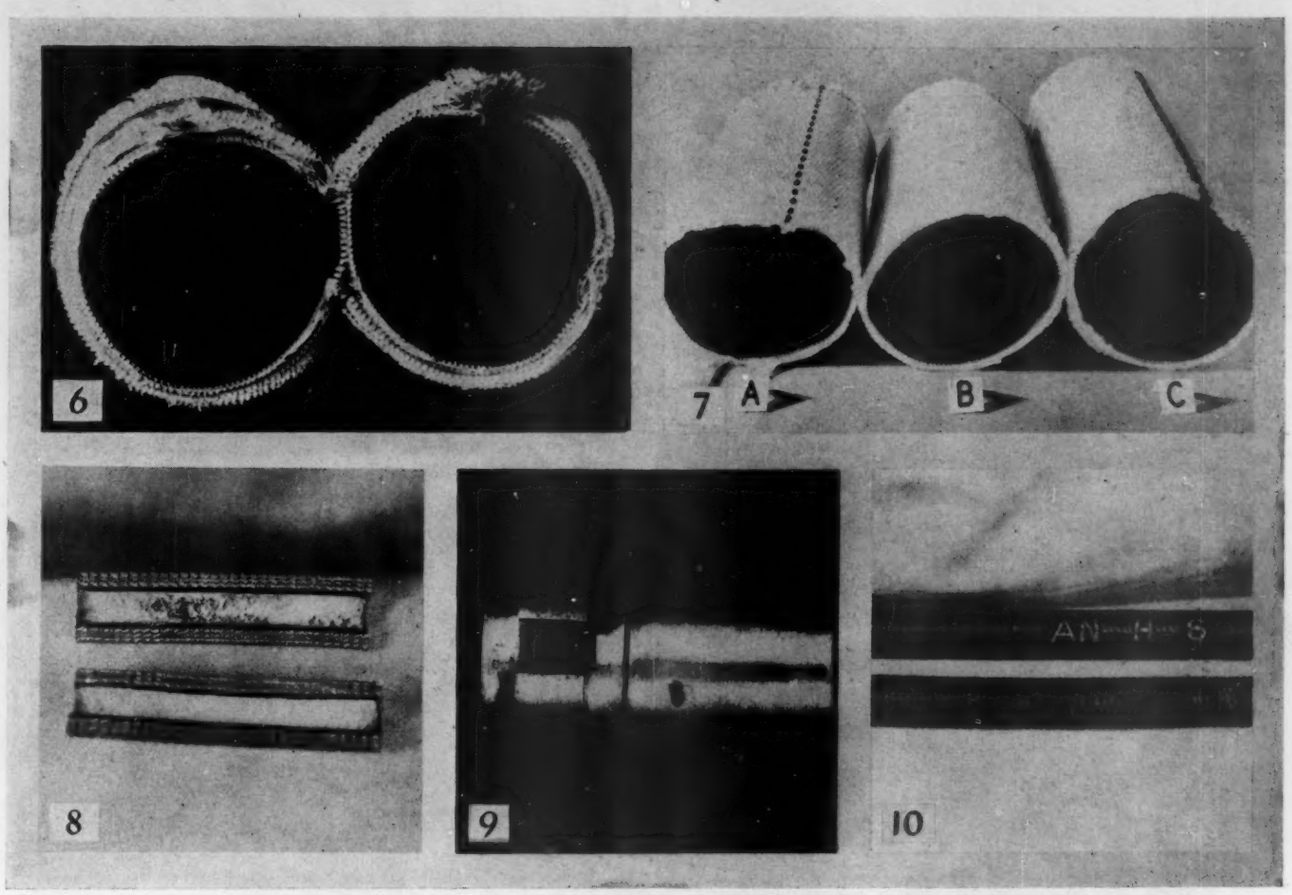
It should be understood that hose having these defects was not offered for delivery under contracts because it had been eliminated by the plant inspector, but for purposes of making a complete collection of all defects which might be experienced, they were included in the assembly.

All hose samples were photographed and were then forwarded to the Washington office of the Bureau of Ships Rubber Section, where they were classified as to major or minor defects in collaboration with numerous experts from the industry.

The Naval inspectors stationed in rubber manufacturing plants or attached to the Naval Shipyards and Depots all contributed to this collection of visually imperfect hose of all types. Several conferences were held with rubber technologists of the Rubber Manufacturers Association Technical Committee, in order to reach an agreement on questionable points of classification.

As a result of this work, covering many years, the Bureau of Ships plans to shortly publish a pamphlet on standard inspection procedure for rubber hose. This pamphlet will be made available to Naval inspectors. The present article has two purposes, namely, to reach persons interested in this matter of standardization and classification of hose defects who will not receive the contemplated Bureau of Ships inspection pamphlet, and, more importantly, to act as an incentive to the accumulation of similar data on other rubber materials, such as belting, strip, sheet and molded gasket material, electric cable and wire, matting and flooring, impregnated fabric, rubber sundry items and many others.

While the greatly depleted staffs in inspection offices and Naval Shipyards, and in the Bureau of Ships itself, make it impossible at present to carry out such a program to extend standardization to all of the abovementioned rubber items, it would be a splendid idea if the technical committees of the Rubber Manufacturers Association, or independent individual rubber manufacturers, would undertake such a program. Upon the accumulation of such data, consideration will be given to the publication of supplements of the present work.



Cotton Jacketed Hose—Minor Defect

(6) Yarn imbedded between cotton jackets. (7) Rough interior of rubber lining. (8) Interior caked with powder due to mandrel being excessively lubricated. (9) Small, non-communicating holes in the coupling resulting from casting defects; no leaking. (10) Indistinct marking compared with satisfactory marking.

Extension of the program of standardization of visual defects to all these other materials besides hose would do much to facilitate procurement, for the manufacturer and consumer alike, and would insure greater utilization of all serviceable materials. Standardization is made much more complex but also more important, in view of the large number of synthetic rubbers, plastic elastomers, and blends thereof that are being used in the industry today. Every year, every month brings new raw materials used in manufacture, and their use inevitably brings with it new and unexpected variations and defects.

It should be emphasized that there is no intention of accepting visually defective material not previously accepted. It is only desired to set forth a uniform acceptance or rejection program which will insure that material of equal quality will receive similar treatment regardless of where it might be offered for delivery under contract.

Generally speaking, the exact quality of rubber hose cannot be completely determined by laboratory checks of components or by examination of the finished item. These have, therefore, been supplemented by service tests or simulated service tests to which hose of the same type and made by the same manufacturer had been subjected under the so-called "prior approval" system of evaluation.

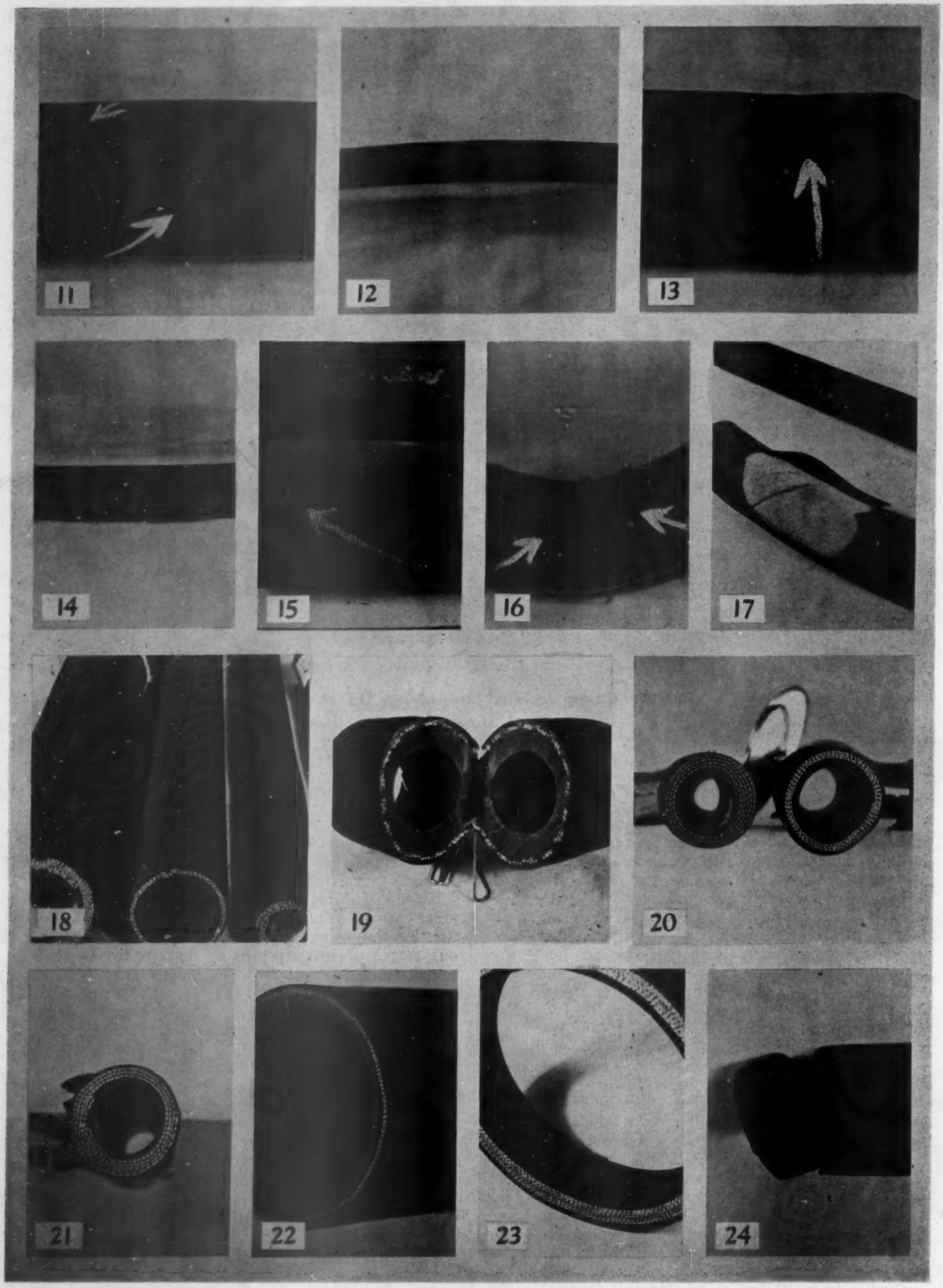
Hose manufacturing plants vary greatly in their control systems and in inspection techniques, as well as in volume output. Hard and fast inspection procedures cannot, therefore, be utilized, but general over-all standardization can be accomplished which must be adapted by the Navy inspector to each specific situation.

Since visual inspection of the finished article will, in a great many instances, not reveal all defects, it is essential that the inspector familiarize himself with the various stages of manufacture so that required constructional details are known to be incorporated. There is no intention on the part of the Navy to specify methods of manufacture or processes, but, due to the complex nature of some of the manufacturing techniques, it is necessary that the inspector is cognizant of the details.

Excellence of process control in all stages of manufacture does not relieve the inspector of the responsibility of making the necessary tests required under the applicable specification, but it certainly does aid in effective evaluation. The particular sampling plan will be specified in the governing specification, contract, or order, and deviation from the sampling plan set up in the specification should never be made without authorization from the Bureau concerned.

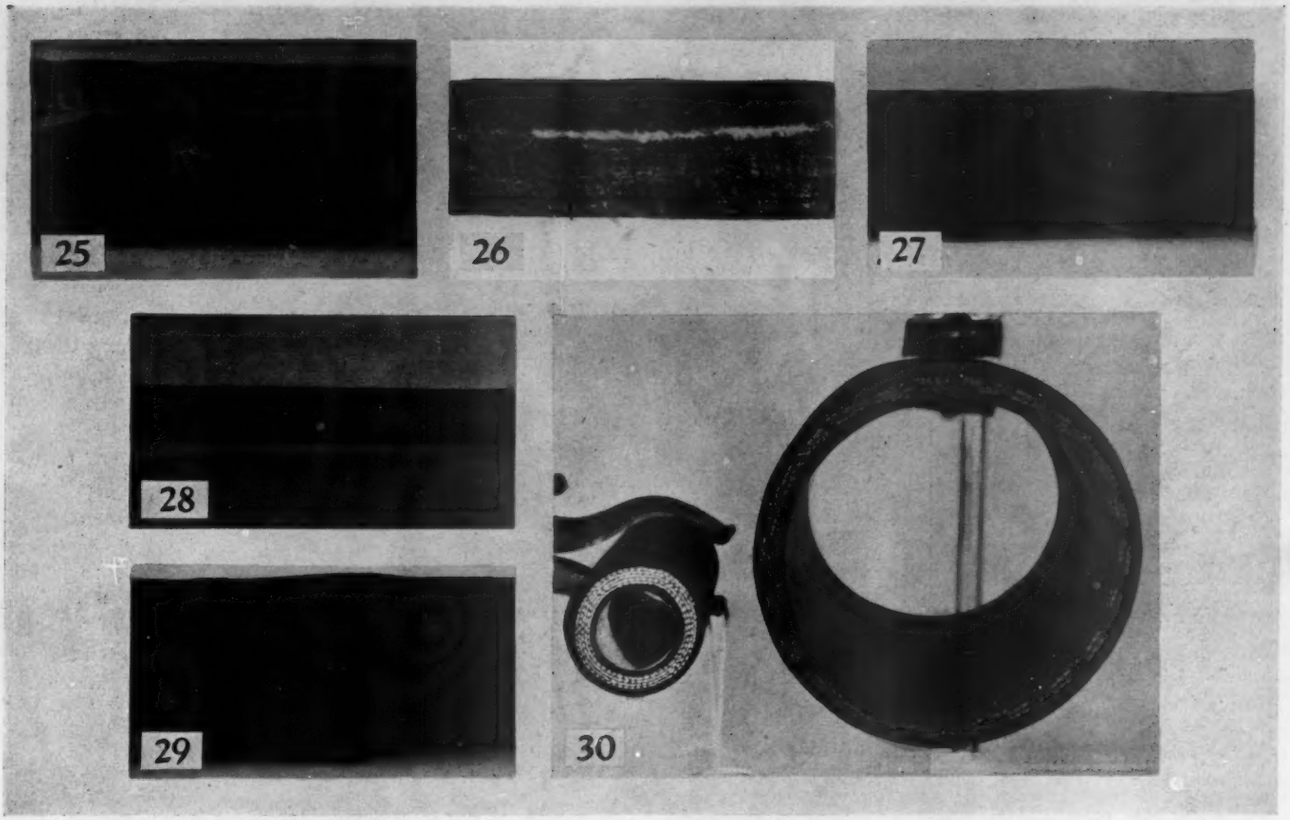
Defect Classification

Defects have been broadly classified into "major" and "minor" defects, any "major" defect being cause for immediate rejection of the hose. The seriousness of "minor" defects should not be overlooked, because, al-



Wrap Cured Hose—Major Defect

(11) Patched cover; patching job, per se, is not objectionable provided a satisfactory job results. (12) A cover defect resulting from under-gauge of cover thickness in braided hose. (13) Lap in cover; this defect, however, is considered repairable. (14) Exposed fabric. (15) Fabric exposed but repairable. (16) Loose cover. (17) Blister under cover. (18) Buckled fabric in carcass detected because it shows as a surface imperfection. (19) Depression in cover of hose causing under-gauge cover and tube. (20) Insufficient amount of plies and poor distribution of plies in a three-ply hose. (21) Insufficient amount of plies and poor distribution of plies in a four-ply hose. (22) Separation of tube from carcass, detectable only near ends. (23) Lap in the tube. (24) Looseness of capped end.



Wrap Cured Hose—Minor Defect

(25) Improper branding due to decal slipping; this minor defect must be repaired. (26) Discoloration of cover. (27) Slightly irregular cover due to repair wrinkles; the edges of depressions caused by the wrap wrinkles are usually sharply defined, thus differentiating them from surface irregularities caused by buckled carcass which have rounded edges, since the defect must be transmitted through the layer of rubber. (28) Slightly irregular cover due to too low a wrapping pressure. (29) Over-gauged cover due to wrapper wrinkles. (30) Unequal wall thickness acceptable only if minimum tolerance on thickness is met.

though the serviceability of the particular hose in question may not be affected, it in itself is an indication of some deterioration in the manufacturing process and, unless promptly rectified, may be responsible for defects which must be classified as "major."

Whether the "minor" defect is caused by impurities in the rubber stocks or by imperfections in the fabric, or in the wire reinforcing materials used, it requires early rectification. Other "minor" defects may be caused by temporary malfunctioning of some mechanical equipment or result from periodic interruption of the process. A typical example of this latter is the malformation of the jacket in a lead press curing apparatus which results on interrupting the operation.

Continuous recurrence of hose possessing "minor" defects is certainly an indication of the manufacturer's unwillingness to overcome malfunctioning of the manufacturing equipment or the manufacturer's indifference as to the quality of his product.

In order to clarify the problem, typical illustrations of defects are shown. However, for the sake of brevity and conciseness, not all of the photographs indicating the typical defects will be shown in this article. Examination of these photographs will readily show the reason for being classified as "major" or "minor" defects, although, in many instances, the distinction between a "major" defect and a "minor" defect is only one of degree.

For the purpose of this classification, hose is grouped into three main types by their method of manufacture, namely, (1) Cotton jacketed, (2) Wrap cured and (3) Lead-press cured. Typical "major" and "minor" defects are grouped under each of these three classifications.

Cotton Jacketed Hose

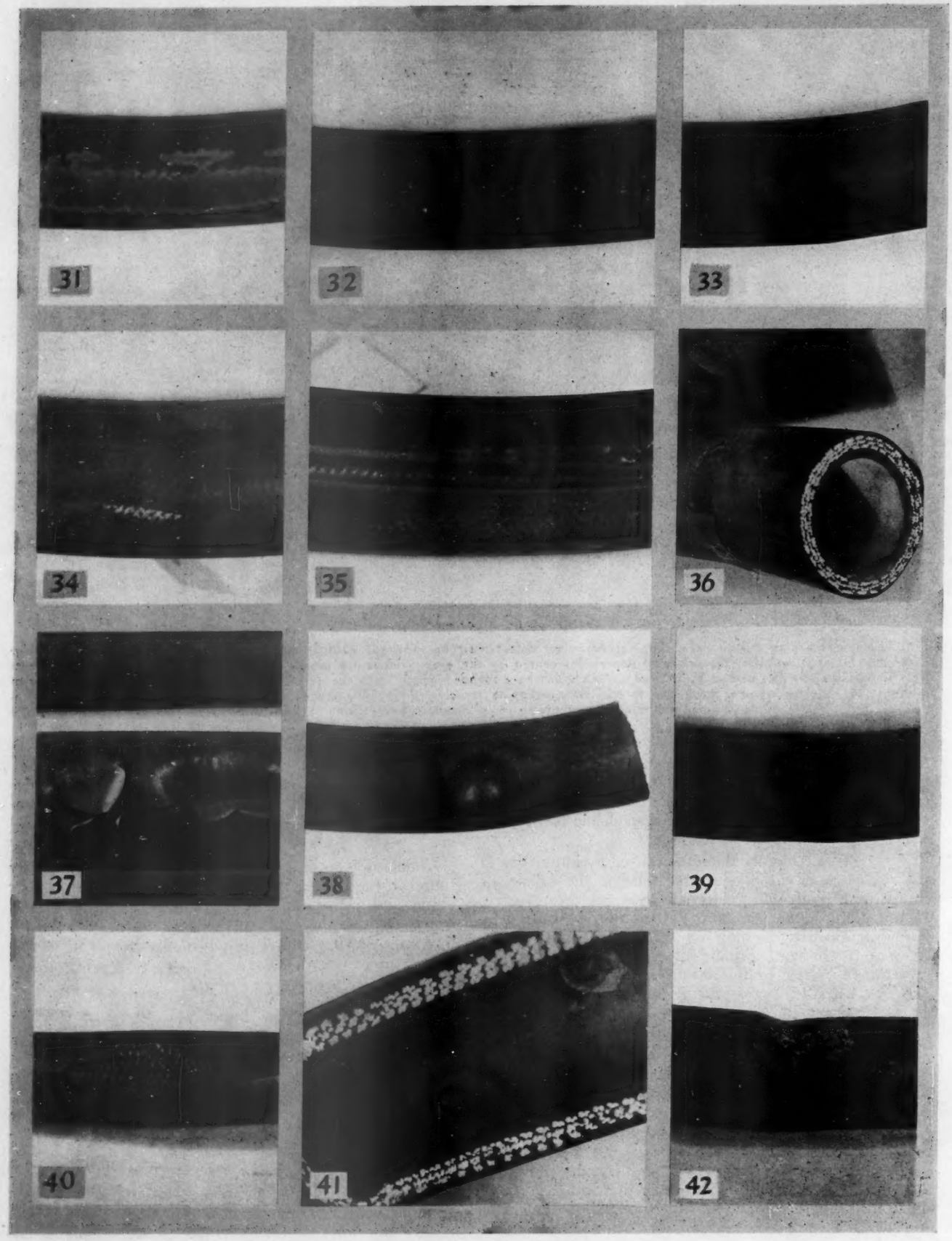
Visible defects in cotton jacketed hose are principally found in the jacket, in the adhesion between the rubber lining and jacket, and in the rubber lining itself, or, if required, in the couplings. The number denotes the figure illustrating typical examples of this type of defect.

Major Defects

(1) Defect in weave of yarn and jacket.
(2) Ridge on the rubber lining results when the inner jacket is too large for the outer jacket.
(3) Bunching of the rubber lining.
(4) Higbee thread in coupling is not full cut. A "full cut" Higbee thread is shown for comparison.
(5) Defect caused by the expansion ring failing to extend over the rubber gasket.

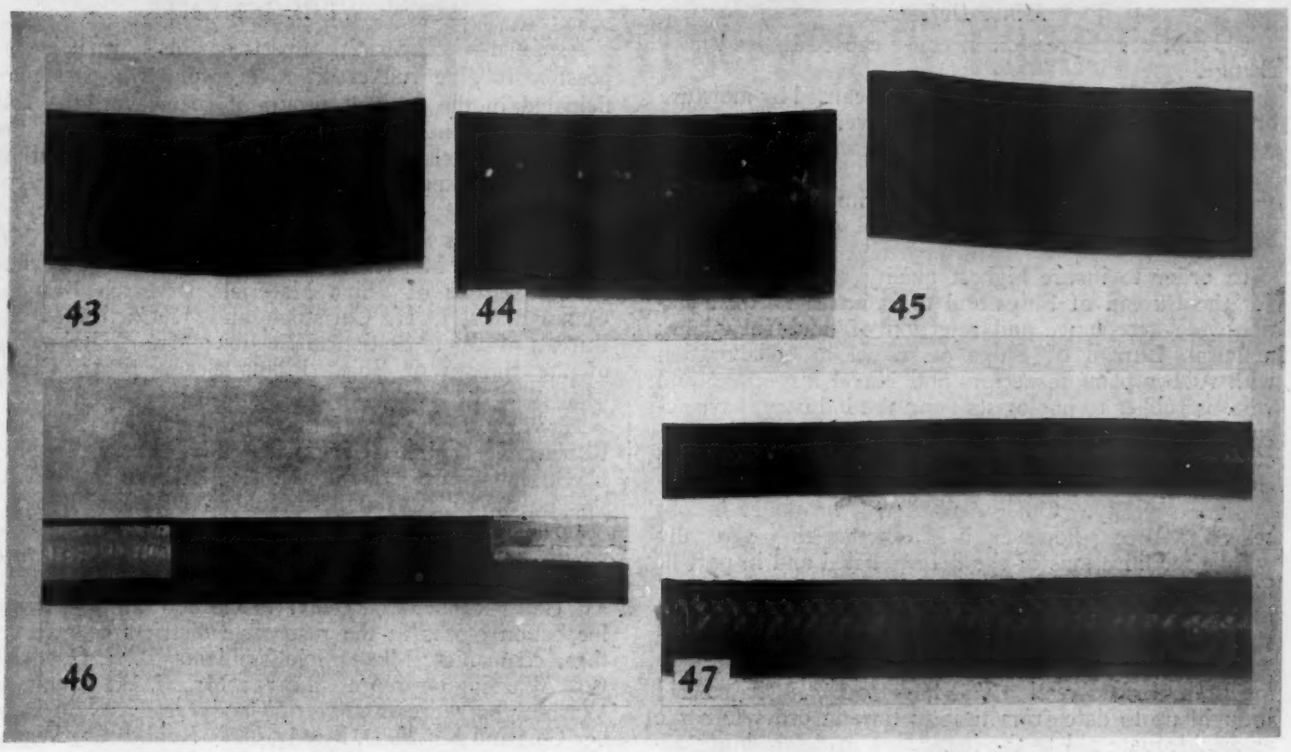
Minor Defects

(6) Yarn imbedded between cotton jackets.
(7) Rough interior of rubber lining.
(8) Interior caked with powder due to mandrel being excessively lubricated.
(9) Small, non-communicating holes in the coupling resulting from casting defects. No leaking.
(10) Indistinct marking compared with satisfactory marking.



Lead-Press Cured Hose—Major Defect

(31) Serious irregularity in cover caused by trapping of moisture between lead and cover during cure. (32) Serious irregularity in cover caused by oil being trapped between lead and cover during cure. (33) Holes in cover exposing the braid; this defect may be repaired. (34) Hole in cover due to cover sticking to lead; this also may be repaired if the area involved is small. (35) Deep groove in cover caused by defective leading. (36) Laps in cover; may be repaired only if small and few in number. (37) Blister under cover. (38) Serious depression in hose caused by dented lead prior to cure. (39) Surface defect caused by tight braid. (40) Imperfection caused by bursting of the lead. (41) Hole in wall of tube which has permitted water to penetrate the carcass thus causing extensive separation of cover. (42) Serious depression in hose caused by lead filler change.



Lead-Press Cured Hose—Minor Defect

(43) Minor depression in cover caused by lead filler change. (44) Shallow depressions in cover caused by moisture or by oil trapped between lead and cover during cure. (45) Bulge due to static wires. (46) Slipping of braid. (47) Rough cover showing braid impression.

Wrap Cured Hose

In general, visible defects in wrap cured hose may be detected in either the cover, in the carcass itself, in the inner tube, in the capped ends or in the coupling.

Major Defects

(11) Patched cover. Patching job, per se, is not objectionable, provided a satisfactory job results.

(12) A cover defect resulting from under-gauge of cover thickness in braided hose.

(13) Lap in cover. This defect is considered repairable, however.

(14) Exposed fabric.

(15) Fabric exposed but repairable.

(16) Loose cover.

(17) Blister under cover.

(18) Buckled fabric in carcass detected because it shows as a surface imperfection.

(19) Depression in cover of hose causing under-gauge cover and tube.

(20) Insufficient amount of plies and poor distribution of plies in a three-ply hose.

(21) Insufficient number of plies and poor distribution of plies in a four-ply hose.

(22) Separation of tube from carcass, detectable only near ends.

(23) Lap in the tube.

(24) Looseness of capped end.

Minor Defects

(25) Improper branding due to decal slipping. This minor defect must be repaired.

(26) Discoloration of cover.

(27) Slightly irregular cover due to repair wrinkles. The edges of depressions caused by the wrap wrinkles are usually sharply defined, thus differentiating them from surface irregularities caused by buckled carcass which have rounded edges, since the defect must be transmitted through the layer of rubber.

(28) Slightly irregular cover due to too low a wrapping pressure.

(29) Over-gauged cover due to wrapper wrinkles.

(30) Unequal wall thickness acceptable only if minimum tolerance on thickness is met.

Lead-Press Cured Hose

Lead-press cured hose visible defects are generally found in the cover, in the carcass, in the tube, and in the coupling.

Major Defects

(31) Serious irregularity in cover caused by trapping of moisture between lead and cover during cure.

(32) Serious irregularity in cover caused by oil being trapped between lead and cover during cure.

(33) Holes in cover exposing the braid. This defect may be repaired.

(34) Hole in cover due to cover sticking to lead. This also may be repaired if the area involved is small.

(35) Deep groove in cover caused by defective leading.

(36) Laps in cover—may be repaired only if small and few in number.

(37) Blister under cover.

(38) Serious depression in hose caused by dented lead prior to cure.

(39) Surface defect caused by tight braid.

(40) Imperfection caused by bursting of the lead.

(41) Hole in wall of tube which has permitted water to penetrate the carcass thus causing extensive separation of cover.

(42) Serious depression in hose caused by lead filler change.

Minor Defects

(43) Minor depression in cover caused by lead filler change.

(44) Shallow depressions in cover caused by moisture or by oil trapped between lead and cover during cure.

(45) Bulge in cover due to static wires.

(46) Slipping of braid.

(47) Rough cover showing braid impression.

Summary

In order to insure highest quality of hose procured for the Bureau of Ships and to maintain uniform nation-wide acceptance and rejection of doubtful quality material, Bureau of Ships personnel in collaboration with rubber plant inspectors and Naval inspectors and various rubber technologists from the industry, have accumulated numerous samples of hose commonly procured for the Bureau, indicating the types of defects and classifying into "major" and "minor" defects according to their severity. Other defects will no doubt be observed at times; however, it is felt that they generally will be modifications of the defects listed and in part illustrated.

Modifications in manufacturing technique and the advent of additional rubber polymers and plastic elastomers will bring with it additional types of defects so that the present classification will have to be expanded and brought up to date from time to time in order to serve as an adequate aid to the inspectors in determining acceptance or rejection of the visual defects observed.

While the extension of the classification of defects to other rubber items than hose is recognized as highly desirable, the carrying out of such a plan is impracticable with present reduced staffs. However, the suggestion is made to industry to initiate comprehensive classification studies.

ACKNOWLEDGEMENTS

As usual in cooperative efforts of this type, it is impossible to give full credit to everyone who has participated in the over-all program. However, the following personnel have played an active part in the assembly and classification of the hose, and the author desires to acknowledge their generous help and cooperation:

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Also Dr. Saunders of the Boston Woven Hose and Rubber Co.; Mr. Helegers and Mr. Harry Frecker, U. S. Rubber Co., Passaic, N. J.; Mr. Donner and Mr. W. Sturtevant, Manhattan Rubber Division of Raybestos-Manhattan, Inc.; Mr. C. W. Brees, B. F. Goodrich Co.; Mr. S. R. Harpfer and Mr. E. G. Kimmich of the Goodyear Tire and Rubber Co.; Mr. C. P. Mullen, Gates Rubber Co., Denver, Colorado; and the Naval inspection offices in the respective districts covered by these companies; Mr. Harold Williams, B. F. Goodrich Co., Washington representative; Mr. C. A. Ammann, Washington representative of Goodyear Tire and Rubber Co.; and Mr. E. D. Meade, U. S. Rubber Co., Washington representative.

Messrs. R. E. Morris, R. James, J. Hollister, and A. E. Barrett of the Mare Island Rubber Laboratory not only helped in assembling typical hose defects of the West Coast area other than Denver, but critically reviewed and revised the classification previously made by Bureau of Ships and industry personnel.

Prevention of Exposure to Organic Solvents

PREVENTION of exposure to organic solvents or their vapors is the objective of every solvent safety program. Yet accidents can and do occur. However, prompt first aid followed by proper medical treatment will generally avoid injury. Following are some first aid measures for exposure to organic solvents:

If an individual is affected by the inhalation of solvent vapors, so that he develops dizziness, nausea, headache, irritation of the eyes or respiratory tract, or other signs of illness, he should be immediately removed to a solvent-free atmosphere. If unconscious, he should be placed on his back and covered to prevent chill. If breathing has stopped, prone pressure artificial respiration should be given.

If solvent is swallowed, the individual should be made to vomit immediately. If solvent enters the eyes, they should be washed promptly with large amounts of water for at least fifteen minutes. For this purpose it is advisable to use a low-pressure supply of water at room temperature in order to avoid shock. If a large quantity of solvent spills on the skin, it should be washed off and an emollient cream applied.

The sense of smell can be a helpful safety aid in operations involving organic solvents. A strong odor of solvent in the workroom is a danger signal; it usually means a high concentration of solvent vapors in the air. Workers should therefore be trained to report promptly a sudden rise in solvent odors, or a smarting of the eyes and nasal passages. These are indications that something has "gone wrong," so that excessive amounts of vapor are escaping. Breathing such amounts of solvent vapors may cause serious illness. Moreover, many organic solvents are flammable, so that a high concentration of vapor in the air may be a dangerous fire hazard.

Because organic solvent vapors may be both a health and fire hazard, solvent-using operations should be carefully controlled, so that the concentration of vapor in the atmosphere is kept to a minimum. Operations may be entirely enclosed, so that no vapor escapes; they may be provided with adequate ventilation, to remove vapors from the atmosphere; or, in certain instances, the worker may be equipped with approved respirators or gas masks.

It is inadvisable, of course, to rely upon the sense of smell as a proof of safety. Odors may not be noticed by men very accustomed to them; sometimes other odors may mask the solvent vapor; also, an atmosphere in which the solvent odor is only barely perceptible may still be unsafe. For these reasons, a periodic analysis of the workroom air, at the breathing level, by a competent chemist is desirable. For some solvents, there are continuous air sampling and recording devices which will help to ensure constantly safe atmospheres.

Safety Research Institute

The Photo-Elastic Properties of Rubber

By L. R. G. TRELOAR

British Rubber Producers' Research Association, Welwyn Garden City, Herts., England

IT is well known that many crystals possess the property of splitting a ray of light incident on their surface into two distinct refracted rays. This phenomenon, which is known as double refraction, arises from the fact that such crystals have different physical and optical properties in different directions. It is only the most highly symmetrical types of crystal structure, such as the cubic class (of which rocksalt is a familiar example), which are physically and optically isotropic (i.e., the same in all directions) and therefore do not show double refraction.

Unlike crystalline materials, substances such as glass or rubber, whose atomic structure is more or less irregular, are normally isotropic in physical properties, as would be expected. But if such materials are deformed, their structural uniformity is disturbed; they cease to be isotropic, and begin to exhibit properties in some ways akin to those of an unsymmetrical crystal. In particular they show double refraction or birefringence, which is a rather sensitive indicator of the structural dissymmetry introduced by the strain.

This property of birefringence due to straining, discovered by Brewster in 1816, is one which has already been investigated in considerable detail in the case of hard materials such as glasses and plastics. It is a property which has been put to practical use in a variety of ways, among which may be mentioned for example, the study of residual stresses in manufactured articles of glass, and the determination of the stress-distribution in engineering structures from the optical study of plastic models. Such applications have been rendered possible through the development of the science of photo-elasticity, which deals with the relation between the birefringence and the stresses or strains, and the experimental technique by which the optical measurements are carried out.

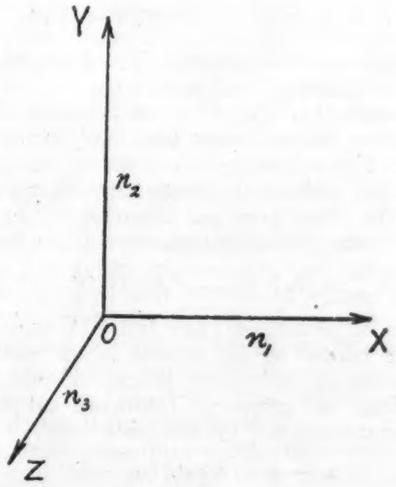


FIG. 1.

FIG. 2—Model of statistically kinked chain. α_1 and α_2 are the polarizabilities of the individual link.

The study of the photo-elastic properties of rubber-like materials is of comparatively recent development, and it is only within the last few years that a quantitative understanding of the phenomena encountered in this field has been achieved. It is the purpose of this article to demonstrate the nature of these phenomena, and to indicate in a rather general way the theoretical basis on which they rest. The subject is complicated by the fact that double refraction in rubber may arise from two distinct causes. There is, first, a part which is related directly to the strain, the genuine "strain-birefringence," and in addition, there is a contribution due to crystallization, (when the deformation is such that crystallization takes place), arising from the fact that the crystallites are themselves doubly refracting.

Double Refraction and Its Measurement

In an isotropic medium the refractive index is a constant, independent of direction. In an anisotropic medium, on the other hand, the refractive index depends on the direction in which the light is propagated, or more accurately, on the direction of the electric vector in the transverse electromagnetic wave. The optical properties of the medium are completely determined if we specify the three principal refractive indices n_1, n_2 and n_3 corresponding to a particular set of three mutually perpendicular directions OX, OY, OZ of electric vector (Fig. 1) which form the principal axes of the so-called "refractive index ellipsoid."

Consider a ray of light traveling in the direction OX (Fig. 1). The refractive index may be either n_2 or n_3 according to whether the direction of the electric vector is parallel to OY or OZ. For other directions of electric vector, the ray may be resolved into two components having the refractive indices n_2 and n_3, i.e., there will be double refraction. The same considerations apply with respect to propagation along OY or OZ.

From the optical point of view crystals fall into three classes. If the three principal refractive indices n_1, n_2 and n_3 are equal, the crystal is isotropic, i.e., does not show double refraction. If two of the indices are equal, and the third different, it shows double refraction for all ray directions except one, which is called the optic axis. Crystals of this class are called uniaxial. If all

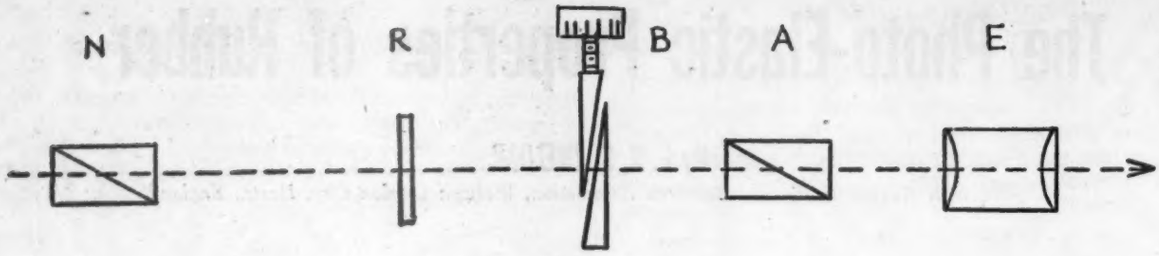


FIG. 3—Optical arrangement for measurement of double refraction. N, polarizing Nicol prism; R, rubber specimen; B, Babinet compensator; A, analyzing Nicol prism; E, eyepiece.

three indices are different, there is double refraction in all directions except two. Crystals of this class, which is the most unsymmetrical, are called biaxial. If rubber is stretched (or compressed) in one direction it becomes optically uniaxial, while if stretched unequally in two directions it becomes optically biaxial.

Optical Properties of a Molecular Network

The refractive index of a material is a function of its response to the electric field of the light wave, or more specifically, to its polarizability. By polarization we mean the separation of positive and negative charges to form a dipole; it is measured by the dipole moment per unit volume. The polarizability is the polarization produced by unit field strength. The greater the polarizability, the higher is the refractive index, the relation between refractive index n and polarizability P being of the form

$$\frac{n^2-1}{n^2+2} = \frac{4\pi}{3} P \qquad (1)$$

If the medium is optically anisotropic, it follows that the polarizability is different in different directions. In the most general case we have three principal polarizabilities corresponding to the directions of the three principal refractive indices, each of which is governed by a relation of the type (1).

In the theoretical derivation of the laws governing the photo-elastic behavior of strained rubber we start from the assumption that the rubber is composed of long-chain molecules cross-linked at certain points to form a loose irregular network. Each molecular chain is considered to be equivalent to a chain of universally-jointed rigid links, in a state of statistical fluctuation of form (Fig. 2).

To account for the optical properties it is further assumed that the links themselves are optically anisotropic, that is to say, that they have different polarizabilities α_1 and α_2 in the direction of their length, and in the perpendicular direction, respectively. From these assumptions it can be shown mathematically *(2)* that the long-chain molecule as a whole is optically anisotropic, the anisotropy increasing as the distance between its ends is increased, as would be expected.

In unstrained rubber the directions of the molecular chains are entirely random, and hence, though the individual chains are optically anisotropic, the bulk rubber is completely isotropic. But if the rubber is extended, the chains become preferentially oriented in the direction of the stretch, and also extended, and these factors together lead to differences of polarizability in the different directions, i.e., to anisotropy or birefringence in the bulk material. In the most general theory we consider a 3-dimensional strain defined by three principal extension ratios λ_1, λ_2 and λ_3 parallel to the axes OX, OY and OZ. It is clear from symmetry considerations that the principal refractive indices n_1, n_2 and n_3 will correspond to the directions of the principal strains. The theory gives for the difference of any two of these principal indices *(3)*

$$n_1 - n_2 = \frac{(\bar{n}^2+2)^2}{\bar{n}} \cdot \frac{2\pi}{45} N(\alpha_1-\alpha_2)\ (\lambda^2_1-\lambda^2_2) \qquad (2)$$

with similar expressions for $n_2 - n_3$ and $n_3 - n_1$. In this expression $\bar{n}$ is the mean refractive index, N is the number of chains (i.e., lengths of molecule between junction points) in the network, and $\alpha_1 - \alpha_2$ is the difference of polarizabilities for the individual link of the chain. Equation (2) may conveniently be written

$$n_1 - n_2 = C(\lambda^2_1-\lambda^2_2) \qquad (2a)$$

which means that the difference of any two of the three principal refractive indices (i.e., the birefringence in a principal plane) is proportional to the difference of the squares of the corresponding extension ratios. The proportionality constant C depends on the nature of the rubber and the degree of vulcanization.

In the most general type of homogeneous strain λ_1, λ_2 and λ_3 are all different, and the three principal refractive indices are likewise all different. Under these conditions the deformed rubber has the optical properties of a biaxial system. If, however, we take a simple elongation, in which two of the dimensions contract in the same ratio, we have, for example

$$\lambda_1 = \lambda \qquad \lambda_2 = \lambda_3 = 1/\lambda$$

and

$$n_1 - n_2 = n_1 - n_3 = C(\lambda^2 - 1/\lambda) \qquad (2b)$$

representing a uniaxial system. The form of the relation (2b) is illustrated in Fig. 5.

The dependence of the stress on the state of strain is derivable from the ordinary statistical theory of elasticity *(4)*. For a homogeneous strain we may define three principal stresses t_1, t_2 and t_3 which act on planes normal to the three principal extensions. The stresses are related to the strains by equations of the type

$$t_1 - t_2 = NkT\ (\lambda^2_1 - \lambda^2_2) = G(\lambda^2_1 - \lambda^2_2) \qquad (3)$$

Comparison of equations (2a) and (3) shows that the stresses are related to the strains in the same way as the differences of refractive index. Combining these two equations we arrive at following simple relation between the stresses and the birefringences

$$n_1 - n_2 = \text{const. } (t_1 - t_2) \qquad (4)$$

This very important result means that, for light propa-

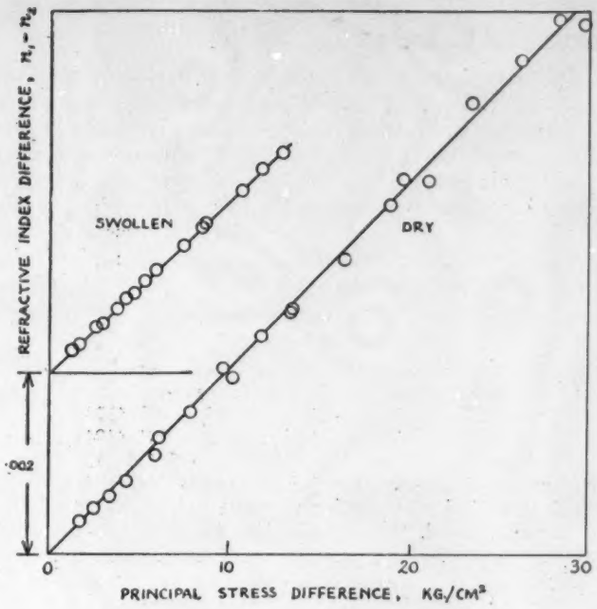
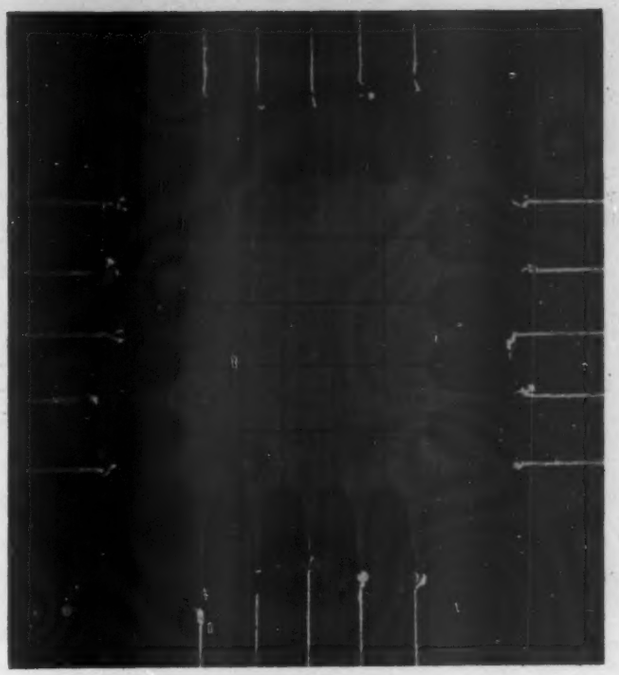


FIG. 4—Proportionality between double refraction and difference of principal stresses in 2-dimensional strain. (Reproduced from "Proceedings of the Physical Society.")



Rubber sheet stretched by factors of 2.0 and 2.5 in two perpendicular directions.

gated along a principal axis of strain, the birefringence is proportional to the difference of the corresponding principal stresses. This is, in fact, Brewster's law, which has been found experimentally to apply in the case of hard (glasslike) solids, and which is now derived theoretically for a rubber-like material, even when the elastic strains are very large.

Experimental Investigations

An investigation of the applicability of the theoretical laws represented by equations (2), (3) and (4) has recently been carried out by the author. The optical arrangement, illustrated diagrammatically in Fig. 3, consists essentially of a polarizing Nicol prism N set so that the plane of polarization of the light incident on the rubber specimen R is at 45° to the direction of the principal extensions; a Babinet compensator (B), by which the double refraction is actually measured, and an analyzing Nicol (A), set at right angles to the polarizer.

In one series of experiments a sheet of vulcanized natural rubber was stretched by different amounts in two directions at right angles, by a method described elsewhere *(5)*, with simultaneous measurement of the principal stresses, the principal extension ratios, and the double refraction for light passing normally through the sheet. The form of the strained sheet is shown in the accompanying photograph. Fig. 4 illustrates the kind of result obtained.

In conformity with equation (4), the birefringence was found to be proportional to the difference of the principal stresses, both for a dry rubber and for the same rubber swollen with a heavy paraffin. It was also shown that the birefringence was approximately proportional to the difference of the squares of the principal extension ratios (equation 2a). Hence all the main theoretical conclusions are verified.

In the above experiments the extension ratios did not exceed about 3.0, and under these conditions there was no evidence of crystallization.

The theory discussed above is valid only for a rubber in which there is no crystallization, for it assumes a random or purely statistical configuration of the molecular chains. This assumption is clearly inconsistent with the presence of an appreciable amount of crystallization, for in a crystalline region the chains are arranged in regular parallel bundles, and the crystallites themselves have a strong orientation in the direction of the principal extension. We should therefore expect the theory to break down when crystallization commences.

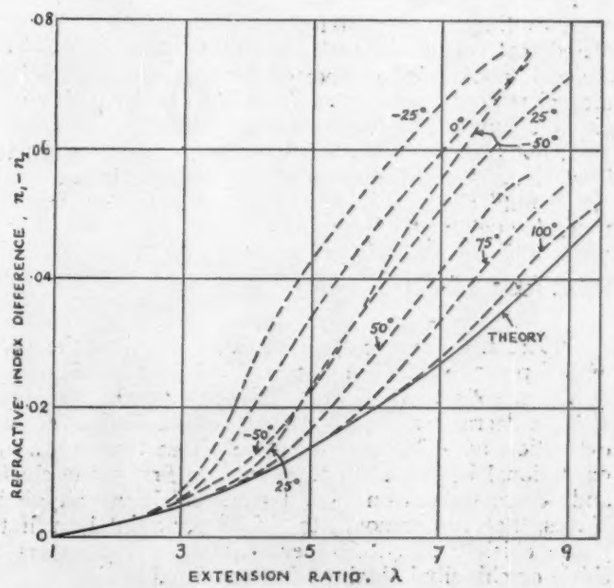


FIG. 5—Double refraction at various temperatures as a function of elongation. (Temperature in degrees Centrigrade).

Experiments in which a strip of rubber was subjected to a simple elongation at various temperatures, yielded the results shown in Fig. 5 *(6)*. At the highest temperature, 100°C., where the amount of crystallization is probably very small, the experimental relation between birefringence and elongation agrees fairly well with the theoretical form (2b), but with successively lower temperatures, the curves depart from this form at smaller and smaller extensions. This is in agreement with the well-known fact that the extension at which crystallization starts is progressively increased with rising temperature.

There is, however, an anomaly at very low temperatures. The curves indicate that at —50°C. there is actually less crystallization than at —25°C. The reason for this exceptional behavior is that at sufficiently low temperatures the rate of crystallization becomes very slow, on account of the high internal viscosity of the rubber. A similar phenomenon has been reported by Bekkedahl *(7)*, who found the rate of crystallization of unstretched raw rubber to pass through a maximum at about —25°C.

Summary and Conclusion

The experimental results reported above substantially verify the theoretical laws of photo-elasticity in the range in which crystallization is absent, and give a qualitative indication of the variations of crystallization which occur outside this range. The degree of agreement with the molecular theory provides further independent proof of the value of this theory (which is essentially the statistical theory of rubber-like elasticity) as a basis for the interpretation of the physical properties of rubber.

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(6) Treloar, *Trans. Faraday Soc.*, Vol. 43, p. 284 (1947).
(7) Bekkedahl, *J. Res. Nat. Bur. Stand.*, Vol. 13, p. 410 (1934); see also, Wood, "Advances in Colloid Science," Vol. II, p. 64.

Note: One of a series based on lectures delivered during 1947-48 by members of the staff of the British Rubber Producers' Research Association at Newton Heath Technical School, Manchester, England.

Report on the Chicle Industry in Guatemala

EXPORTS of chicle and chiquibul from Guatemala during 1945 amounted to 4,081,162 pounds with a declared value of $2,552,961. Export duties at $10 per quintal of 101.43 pounds totaled about $402,362. The 1945 exports were 17.3 percent larger than the 3,480,498 pounds exported in 1944, 15.6 percent larger than the previous high of 3,530,724 pounds registered in 1942, and 211 percent larger than the 1,310,941 pounds shipped in 1937. Compared with the 8-year average, 1937-44, the 1945 shipments showed an increase of 63.7 percent.

Depending somewhat on climatic conditions, it is estimated that between 40,000 and 50,000 quintals of chicle and chiquibul will be exported from Guatemala during the chicle crop year ending May 31, 1947. Tapping begins on June 1 and terminates about March 31 of each year, but transportation of chicle from forest camps to local airports and thence to Puerto Barrios is not completed until about May 30. Thus, chicle shipments continue throughout the year.

Export Taxes a Factor

Export taxes on chicle have been levied at the rate of $10 per quintal since June 1, 1943. The municipality of Peten collects taxes of $0.25 per quintal. In May, 1946, a decree was adopted which established a fee for extraction of chicle and chiquibul from trees growing on national lands—$10 per quintal on first-grade chicle and $8 per quintal on second-grade chicle or chiquibul. Taxes, therefore, amount to $20.25 per quintal on first-grade chicle and $18.25 per quintal on second-grade chicle or chiquibul obtained from national lands.

Chicle and chiquibul are extracted from a tree known locally as chico-zapote *(Sapota achras* or the sapodilla tree). Second-grade chicle or chiquibul, however, is extracted from a slightly different variety of chico-zapote than that producing first-grade chicle. First-grade chicle is found only in the Guatemalan Department of Peten in areas north of Lake Peten-Izta.

Chiquibul or second-grade chicle produced in Guatemala comes from Peten south of Lake Peten-Izta and from limited areas in the Departments of Izabal and Alta Verapaz. Considerable land south of Lake Peten-Izta is privately owned, but north of the lake practically all the land is nationally owned.

First-Grade Chicle Preferred

Jelutong from the Far East was also used in the United States as a chewing-gum base prior to the war. With resumption of shipments from the Far East, it is predicted that production of second-grade chicle or chiquibul in Guatemala will fall to 25 percent of the present volume in 2 years unless taxes are reduced. Guatemalan output of first-grade chicle, however, will continue at a high level, for Guatemala, Mexico, and British Honduras are the only sources of supply.

During the tapping season, from 4,000 to 5,000 chicleros are usually employed, and are said to have earnings greater than those of any other laboring class in Latin America. Many of these chicle gatherers are brought from Mexico and British Honduras, for the work is of a skilled nature and can be handled properly only by trained and experienced men.

Use of air transportation has been the chief factor in the growth of the chicle industry in Peten. There are 13 airports in the district and service is provided by Aviateca, licensed by the Guatemalan Government. Without reliable air service to transport chicle and deliver supplies to the chicleros working in the jungles surrounding the airports, chicle production would be curtailed.

Engineering with Sponge Rubber

By CALVIN S. YORAN

Research Director, Brown Rubber Co., Inc., Lafayette, Ind.

AS the name implies, sponge rubber is a rubber product having a more or less open structure which resembles that of a natural sponge. Since the term sponge rubber is applied to several quite different processes and it would be impossible to discuss all of these fully, a brief outline of these processes will clarify the discussion to follow. The different processes are:

I. Open-Cell Structure—Cells interconnecting.
   A. Latex Foam—Made directly from latex.
   B. Chemically Blown Sponge Rubber.
   C. Open Steam Process—Bath sponge type.

II. Closed-Cell Structure—Individual cells not connected.
   A. Expanded by external gassing.
   B. Expanded chemically.

Inasmuch as chemically blown sponge rubber is the field in which I have had most experience, I will limit my discussion to this type which is probably the largest volume.

Chemically blown sponge is manufactured from crude or synthetic rubbers in solid form much the same as mechanical or molded solid rubber items. The porosity is usually obtained by the liberation of carbon dioxide from bicarbonate of soda during vulcanization in a mold. Many other blowing agents have been used and recently several organic compounds have been offered which decompose to form ammonia, carbon dioxide or nitrogen.

The rest of the compounding of sponge rubber resembles that of solid rubber except that the crude rubber must be plasticized well before mixing and much larger amounts of softeners are used so that sponge can be blown to shape easily. Sponge rubbers can be made using nearly all synthetics but most sponge is made using either natural rubber or GR-S. Some oil-resistant sponge is manufactured using neoprene or Buna N type polymers.

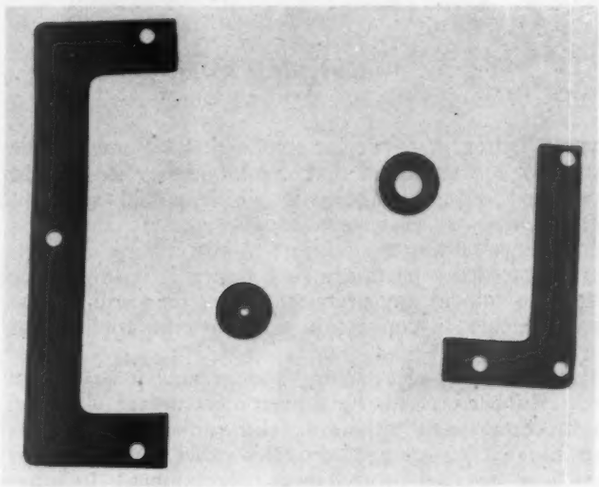


FIG. 1—Parts die cut from sponge rubber sheets.

After a sponge compound has been mixed, it can be shaped for molding either by calendering or extruding which again parallels solid rubber manufacture. The one difference lies in the fact that most sponge compounds are so soft and sticky, and therefore a dust such as talc or mica must be used to prevent sticking to liners, boards, etc. This dusting powder is also essential to the molding which follows.

The first sponge offered commercially was in the form of sheets which were cured in a steam-heated press between layers of fabric. The fabric served to allow air to escape so that a smooth sheet was obtained with just the imprint of fabric. Without fabric and dust, sponge would have a very rough pitted surface due to trapping of air as the sponge blew up against the plate.

To manufacture sheet sponge, the compound is calendered to a gauge ½ to ¼ the final thickness depending on the density of the piece and the compound. This sheet of uncured compound is placed in a frame of thickness desired plus shrinkage factor with fabric above and below. This is then placed in a press heated to 290° to 325° F. and chemicals form gas within rubber causing it to expand and fill the entire space and acceleration is adjusted so that vulcanization sets rubber in this expanded condition.

While sheet sponge is still made in large volume and is die cut or cut in strips to form many parts (Fig. 1), many complex parts are being molded to shapes which

TABLE I—PHYSICAL REQUIREMENTS OF CELLULAR RUBBERS—TYPE R—NON-OIL RESISTANT

Grade Number	Basic Requirements: Load Deflection—25% Deflection—P.s.i.	Requirements Added by Suffix Letter: Suffix A Oven Aged 7 Days at 158° F. Change from Original Load Deflection Limits—Percent	Suffix B Compression Set—70 Hours at 158° F.—50% Deflection Max.—Percent	Suffix F Low Temperature Test—Change from Original Load—Deflection Max.—Percent
R10	1±1	±20	15	25
R11	3.5±1.5	±20	15	25
R12	7±2	±20	20	25
R13	11±2	±20	25	25
R14	15±2	±20	25	25
R15	20.5±3.5	±20	25	25

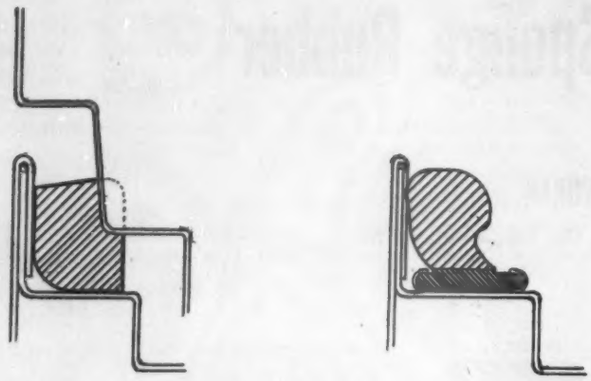


FIG. 2—Early door strips.

function better in particular application. Some twelve years ago, it was found that a solid rubber skin could be molded on a sponge part which would seal out moisture as well as give a tougher, better appearing and better weathering surface. While this skin is advantageous, many parts are so complex it is impossible to apply a skin in any practical way. This will be discussed further in connection with specific applications later.

Many methods of attaching sponge rubber have been tried. Rubber cements have been most universally used but in certain applications a solid rubber backing has been molded to sponge and this solid rubber either clipped or inserted in a channel or retainers. In other parts, fabric has been molded into sponge and this used to tack or fasten the strip in place.

Metal inserts of one type or another have been widely used to insure that sponge will be kept in place. Wire screens have been imbedded in certain radio parts and flat metal inserts with extending tabs have been molded into sponge door bottoms to securely fasten the strips to the door.

Specifications for Chemically Blown Sponge

Originally, specifications were very indefinite and consisted mainly on agreements between customer and supplier on samples which were made up for the particular part. The next step was to specify density which was usually expressed in ounces per cubic inch. A very soft sponge usually ran in the range of 0.12 to 0.16 ounces per cubic inch. A soft density sponge would be in the range of 0.18 to 0.22. A medium range would be 0.25 to 0.30 and firm ranged above 0.30 oz. per cubic inch.

There were some attempts to specify tensile and elongation but these properties have little to do with the function of sponge which is used under compression.

Compression set under constant deflection was next to be specified and this is a very important property of sponge. There were some attempts to specify load deflection tests on both test slabs and parts before the war but during the war the greatest strides were made in establishing standard specifications for sponge as well as all forms of rubber products. These specifications resulted from cooperation between committees of SAE, ASTM and the Rubber Manufacturers Association.

These SAE-ASTM specifications (ASTM D-552-47) set up classifications due to load deflection as tested on pieces cut from a test slab. Besides establishing these grades, they set up reasonable limits to be attained in compression set and increase in load deflection on aging. Table I is a combined table covering natural rubber and GR-S which is a simplification under consideration by the ASTM committee on sponge specifications.

In addition to the designations shown in Table I, many automobile manufacturers have set up a specification upon the load deflection of an actual strip. These are used by inspection departments of these companies in accepting shipments of material.

Applications in the Automotive Industry

The applications of sponge rubber in the automotive industry may be classified into three main types—Weatherseals, Pads and Vibration Dampners. Under each of these can be listed several specific applications to parts which go into the various parts of the automobile, as follows:

- WEATHERSEALS
  - Door Weatherstrips
  - Windlace
  - Glass Runs and Headers
  - Trunk Opening Weatherstrips
  - Windshield Seals
  - Cowl Ventilator Gaskets
  - Lamp Gaskets
  - Floor Board Seals
    - Battery Cover Seals
    - Pedal Seals
    - Pedal Pan Gaskets
    - Hand Brake Seals
    - Transmission Seals
    - Dimmer Switch Seals
    - Antisqueak Strips
- CUSHIONS OR PADS
  - Armrest Pads
  - Seat Cushions
  - Trim Fillers and Pads
- VIBRATION DAMPNERS
  - Radio Speaker Gaskets
  - Radio Vibrator Liners

Sponge rubber was first used in automobile engineering some twenty years ago in the form of strips and gaskets which were cut from sheet sponge. Since that time, the uses of sponge have increased and complex molded strips are now being used by automotive engineers to perform many important functions.

Weatherseals account for the largest volume of chemically blown sponge used in automotive engineering. This application has paralleled the development of the modern streamlined all-steel body and the present production methods. By using sponge weatherstrips, greater tolerances can be allowed on door and deck lid stampings so that these operations can be practical and

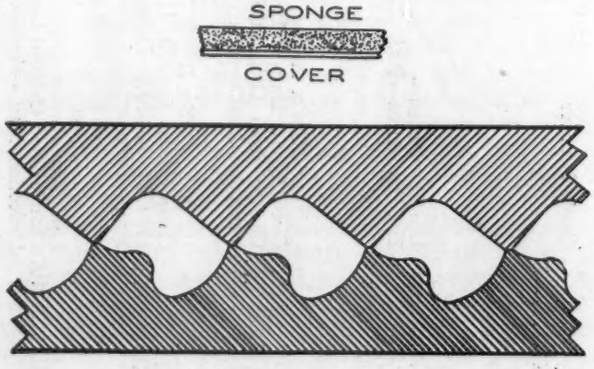


FIG. 3—Typical mold section for sheet loading.

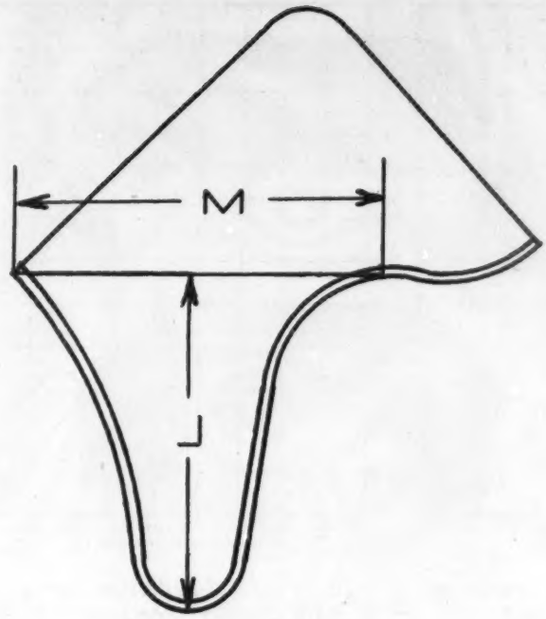


FIG. 4—Lip design.

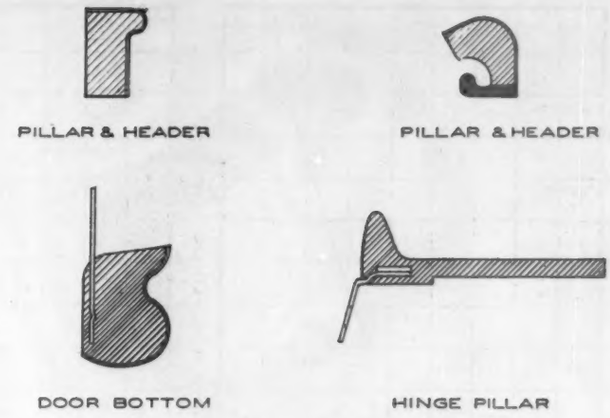


FIG. 5—Door weatherstrips.

give interchangeability of parts. The changes in body design also made it necessary to have an efficient seal to avoid leaks of rain and air around the doors.

Door Weatherstrips: Sponge weatherstrips were used as early as 1934 but these were merely rectangular molded strips cemented to the upper part of the door opening (Fig. 2). In 1935, sponge weatherstrips were molded with a hard solid rubber backing which was inserted in a metal channel to hold the strip in place (Fig. 2). These strips were attached to the doors but only sealed the upper part of doors. In 1935, another idea began the development of an improved type sponge strip. This idea was to cover the exposed sponge surfaces with a solid rubber skin or cover which would seal out water from penetrating into the sponge interior of strips and also give improved strength and abrasion resistance to the sponge.

As rubber manufacturers learned how to accomplish this and as automotive engineers learned to design strips which could be made by practical methods, the use of an applied skin on sponge strips grew until most door weatherstrips and deck lid seals now specify such a skin. By applying a mechanical skin or cover to a sponge weatherstrip, it is possible to obtain a softer, better wearing strip which will not tend to absorb and hold water which will rust the body.

Most door header weatherstrips have come to a type of design which can be "sheet loaded," to use the term of the sponge manufacturers. This method gives lower cost strips as long as the section is constant or as long as the width of the diagonal area of the different sections along the strip. Molds for "sheet loading" are usually ten to eighteen cavities cut parallel from two plates of steel with about a thirty-second of an inch between cavities and parted across diagonal corners of strips in such a way that the exposed surface of the strip is formed by one plate of the mold, while the cementing surface of strips is formed by the other plate.

A sheet of sponge and solid compound plied on the calender is cut to a length a few inches longer than the desired length of finished piece. This sheet is laid into the mold so that the side having the solid skin will be next to the plate which will form the exposed surface of the piece (Fig. 3). After vulcanization, the strips are washed and cut to length while still in sheet form and then slit into individual strips as the final operation. Cotton cord is usually incorporated in long strips to prevent stretching in installing in the automobile body, and this is done either by calendering into the plies or in the mold itself.

Some "sheet loaded" door weatherstrips of this type have been made to use a lever action of a thin lip in sealing in order to require less closing pressure for doors. Considerable difficulty is encountered in manufacturing these strips if these lips are too long or too narrow. The cover or skin compound must stretch and flow down into the lip and if the stretch is excessive it may even break through entirely, causing excessive rejections. In our experiences with numerous sections, it appears that if the length of the lip (L) exceeds the mouth opening (M), the part will be difficult to manufacture (Fig. 4). The lower the ratio of L/M, the easier the strip will be to manufacture and the less thinning of the skin will be encountered.

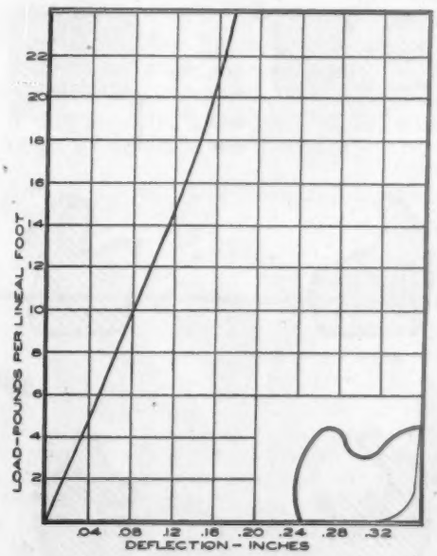


FIG. 6—Load-deflection curve of a common type compression seal.

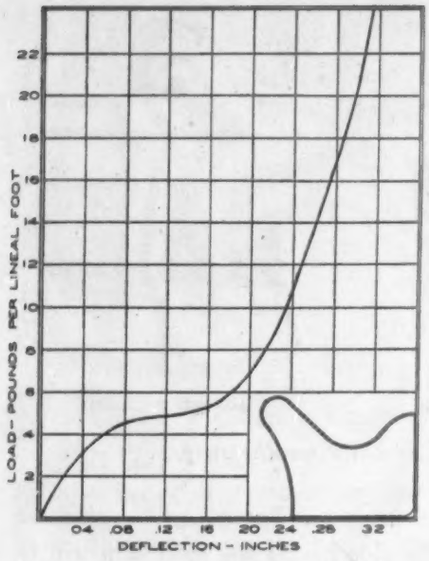


FIG. 7—Load-deflection curve of a lever type seal.

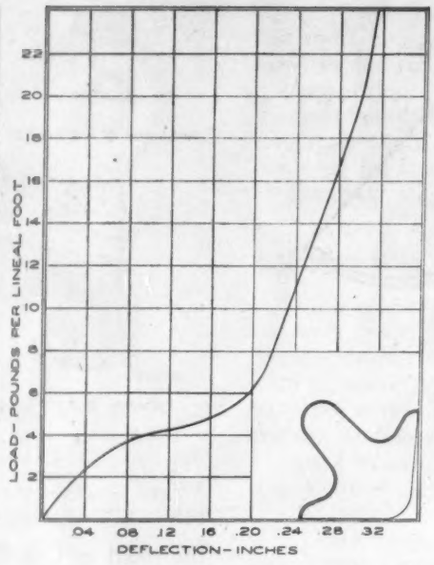


FIG. 8—Load-deflection curve of another type lever seal.

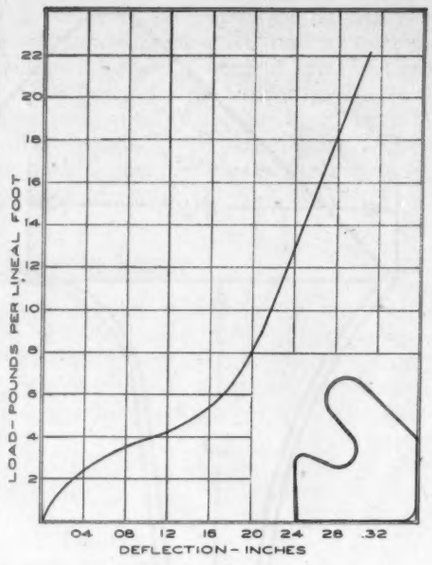


FIG. 9—Load-deflection curve of still another type lever seal.

The radius at the end of lip may also be a source of trouble if it is too small, and it would be our suggestion that this be eighty thousandths of an inch at least and preferably larger. If there are any appreciable undercuts or backdrafts, there will be a tendency for the cover to be sheared through and sponge exposed. Some variation in the section can be manufactured successfully, but the distance across parting should remain constant and in the same plane.

It will be noted in the sketches and curves shown in Fig. 5 that some door weatherstrips seal by straight compression of sponge while others are either lever or combination of lever and compression. Maintaining uniformity of compressibility of door weatherstrips using straight compression is difficult while lever or combination of lever and compression tend to give less variation in closing pressures even though there may be considerable variation in the stiffness of the sponge.

In Figure 6, the load-deflection curve of a common type compression seal has been drawn and it will be noted that the load rises very rapidly with deflection. The specification on this strip shows a range of 8 to 25 pounds to deflect 0.125″ for a one-foot length. Figure 7 shows the load-deflection curve of a lever type seal and the advantage of the lever type can readily be seen. The deflection from .1″ to .2″ causes only a change of about 2 pounds in load. The specification on the part is a load of 7.5 to 8.5 pounds at a deflection of 0.185″. Figures 8 and 9 show two other type lever seals and the advantage of lower closing pressure to be obtained in this type strip.

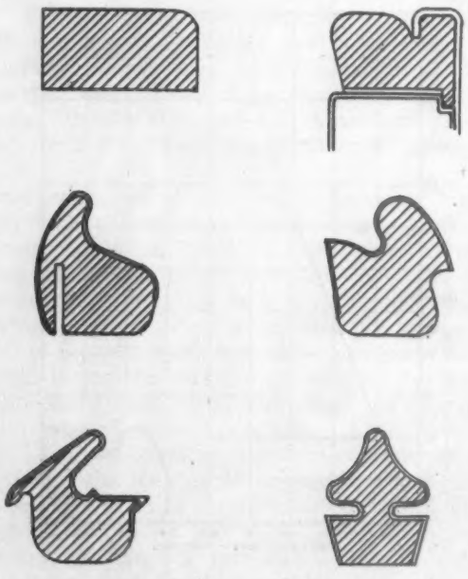


FIG. 10—Trunk strips.

Windlace: For many years, sponge "cord," usually one-half inch round, has been used as windlace filler and in some models there have been strips across the door bottom to serve as a continuation of windlace in sealing out wind.

Glass Runs and Headers: At one time most windows had glass runs and headers containing sponge rubber, but in recent years most of these have been replaced by mechanical rubber.

Trunk Opening Weatherstrips: Trunk or deck lid seals have long been a large and important use of sponge rubber. These have also gone through the transitions outlined above for door weatherstrips. Some earlier strips were merely strips cut from sponge sheet depending upon straight compression for sealing. Some strips were molded with a lip which fit in a retaining channel in a body to insure strips staying in place while others fit in the trough in body stamping. Several of the present trunk seals depend upon a lever type seal or a combination of lever and compression (Fig. 10).

Windshield Seals: Windshield seals were quite important at one time when windshields opened and the ability of sponge to seal when closed gave it preference on this application. Since present models have stationary windshields, this application is no longer being used.

Cowl Ventilator Gaskets: Cowl ventilators have been a difficult seal to maintain and sponge is used by some

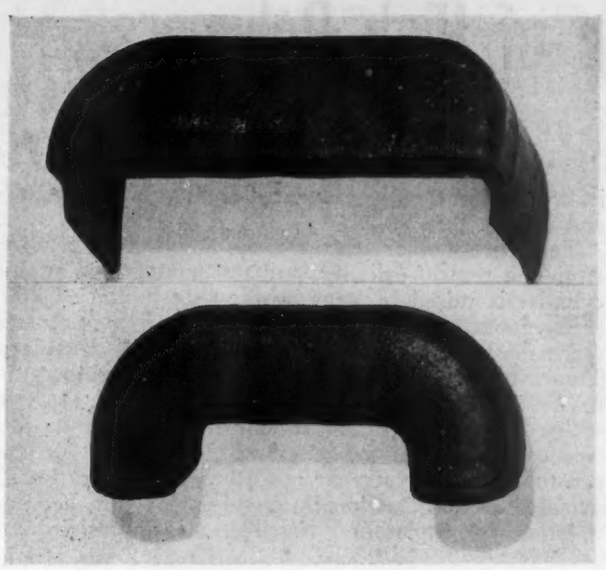


FIG. 11—Armrest pads.

manufacturers while the soft mechanical type is preferred by others. It has been difficult to apply a solid rubber skin to such a part as this since it is very small in cross-section and irregular in shape.

Lamp Gaskets: Both head lamps and tail lights have made use of sponge seals. Some of these sponge compounds have been non-tarnishing and heat resistant formulas.

Floor Board Seals and Antisqueaks: Floor board seals may be die cut from sheet sponge or molded to any desired shape. These seals usually serve not only as weatherseals to keep out water and air, but also as antisqueaks between panels or plates. Since these seals are usually quite simple and rarely opened, no solid skin is necessary.

Cushions or Pads: Armrests for front doors and backseats (Fig. 11) have added to the luxury of our modern cars by giving a soft support and cushion. Front door armrests also serve the added function as a handle to pull the door closed. Seat cushions of foam latex over seat springs give a softer, more comfortable ride. Trim fillers add to the trim design and also may serve to cushion sharp edges as a safety measure as crash pads.

Vibration Dampners: Radio speaker gaskets (Fig. 12) serve to cushion the radio against shock and seal

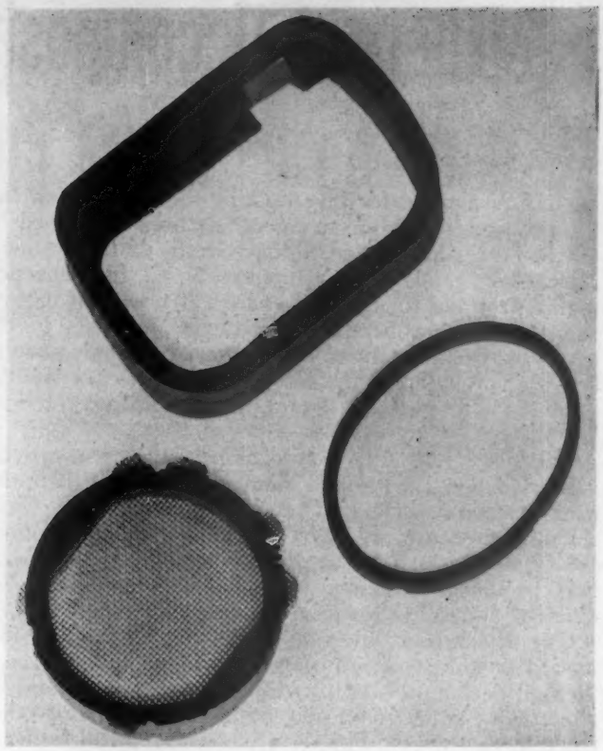


FIG. 12—Radio speaker gaskets.

between set and dashboard of the car. Radio vibrator tubes or socks serve to dampen both vibration and sound produced by small vibrators used to develop alternating or pulsating current from the battery. Sponge for this application must be compounded with low sulfur to give non-tarnishing, heat-resistant sponge.

Summary

It is difficult to give any rules or formulas for engineering with sponge rubber. The illustrations given may serve to suggest methods of using sponge rubber for solving sealing or cushioning problems but it is suggested that engineers designing sponge rubber parts consult a sponge rubber manufacturer outlining their problem and discuss preliminary designs. In this way, parts can be designed which will be more economical to manufacture, give better service, and be more easily obtained from sponge manufacturers.

Note: This paper was presented at the Chicago Technical Conference held in Chicago, Ill., on March 24, 1948.

Corrosion-Proof Plastic Pipe

A new corrosion-proof plastic pipe has been developed by United States Rubber Company for use in chemical manufacturing, mining and other industries. The pipe is made of the company's revolutionary new Kralite, a blend of synthetic rubber and thermoplastic resins. It will be supplied in rigid and semi-rigid forms in sizes ranging from ¼ to 2 inches outside diameter. It may be bent to various radii and threaded for fittings.

The pipe is made by a continuous extrusion process. Raw materials are put into one end of an extruding machine and finished pipe comes out the other end. No metal or fabric reinforcement is used in the construction. While the plastic pipe is more expensive than most types of metal pipe, it is expected to gain widespread use in many industries because of better resistance to chemical corrosion and weather.

Thermal Decomposition of High Polymers

A NEW method for investigating the composition and properties of high polymers has been developed by S. L. Madorsky and Sidney Straus of the National Bureau of Standards, Washington, D. C., in connection with a program for the study of the structure of natural and synthetic rubbers. The procedure consists in the pyrolysis, or thermal decomposition, of the polymer under high vacuum with subsequent separation of the products into gaseous, liquid, and semisolid fractions for analysis.

Polymeric substances—such as polystyrene, neoprene, rubber, nylon, Lucite, and many others—owe their unusual strength, elasticity, and plasticity to the long, chainlike structure of their molecules. Such compounds are formed in nature or in the laboratory by polymerization, in which sometimes as many as several million individual molecules are joined by chemical reaction.

One of the most effective means for obtaining information on the structure of polymers and copolymers is thermal decomposition of a sample under conditions of molecular distillation in the absence of oxygen or other reactive substances. The term molecular distillation has been applied to that type of distillation where there is no return of escaping molecules to the evaporating surface. This is ordinarily accomplished by operating with high-boiling (low-vapor pressure) liquids under such high vacuum that the mean free path of the escaping molecules is of the order of the distance between the surface of the evaporating liquid and the cooled condensing surface of the still.

Under these conditions in pyrolysis, the fragments into which the polymeric chain is decomposed by heat may be distilled and collected without further fragmentation due to molecular collision. From a study of the way in which the polymeric chain breaks up—as shown by the length and type of fragments formed, the relative amounts of monomeric to longer fragments, and similar data—much can be learned about the arrangement of the monomeric units in the chain and the relative strength of the chemical bonds involved. Pyrolysis also provides a means for determining optimum conditions for recovery of the component monomers from scrap polymeric substances.

The apparatus developed at the Bureau consists essentially of a double-walled cylindrical flask similar to a Dewar flask except that the inner vessel is joined to the outer jacket by a ground-glass joint. The space between the cylinders is evacuated to a pressure of one millionth of a millimeter of mercury and is connected, by means of a side arm, to receivers for the various fractions. At the bottom of this space is a small tray on which a thin layer (25 to 50 milligrams) of the polymer is heated to between 300° and 400° C. by means of platinum-wire helices encased in short lengths of glass tubing. During pyrolysis the outer wall of the flask is cooled by water flowing through spiral tubing surrounding the vessel.

Liquid air is first placed in the inner cylinder, and the temperature of the sample is then raised to the point of decomposition. All the products of pyrolysis, except those which do not condense at liquid-air temperature, then collect on the inner wall, while the more volatile material is allowed to expand into a receiver. This gaseous fraction is analyzed in the mass spectrometer; its weight can then be calculated from volume, pressure, and composition.

To separate other fractions, the liquid air is removed from the central cylinder, and the temperature of this cylinder is raised in steps by the substitution of other refrigerants, such as dry ice, until room temperature is reached. This permits fractions which are volatile at temperatures between liquid-air and room temperature to distill over into liquid-fraction receivers, each of which is maintained at the temperature of liquid air. The condensate on the inner wall, volatile at the temperature of pyrolysis but not at room temperature, is obtained as one fraction by dissolving it with benzene, collected in a platinum crucible, and vaporizing the benzene.

Additional fractions are provided by the semi-solid residue in the tray and the deposit, nonvolatile at room temperature, which condenses on the outer wall of the evacuated space. This latter fraction, which may safely be assumed to have the same composition as the deposit on the liquid-air chamber, is not collected, but its weight is calculated by subtraction of the weights of the other fractions from that of the sample. The gaseous and liquid fractions thus obtained are analyzed in the mass spectrometer, while the semi-solid fractions are identified by other physical and chemical methods of analysis.

Because of its relatively simple structure, polystyrene was the first polymer selected for study. This compound was found to break up at the temperature of pyrolysis into the monomer, dimer, trimer, and some tetramer. The most striking observation was the consistency with which only small fragments, none longer than the tetramer, were obtained. Doubtless the larger molecular fragments became entangled in the mass of long-chain polystyrene molecules and were held until they decomposed further into shorter lengths.

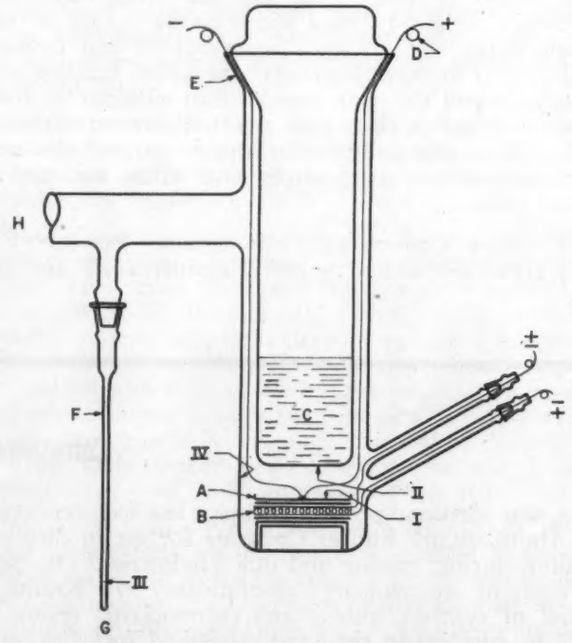


Diagram of the apparatus developed for studying the structure and properties of high polymers.

Rubber Division, Chemical Institute of Canada, Will Hold Annual Meeting in Montreal on June 9

THE presentation of eleven technical papers will feature the annual meeting of the Rubber Division of the Chemical Institute of Canada which will be held at the Windsor Hotel in Montreal, Canada, on Wednesday, June 9. The meeting is being held in conjunction with the 1948 Conference and Exhibition of the parent society, headquarters for which will be maintained at the Mount Royal Hotel. G. E. Gollop, of Canadian Industries, Ltd., is General Secretary of the Conference Committee. J. T. Black, of the Polymer Corporation, is secretary-treasurer of the C.I.C. Rubber Division. The Division will hold a business meeting following its first technical session on the morning of June 9. A dinner and ball will be held at the Mount Royal Hotel on the evening of June 9. Abstracts of the papers to be presented at the Rubber Division meeting, together with their authors and company connections, follow:

Wednesday Morning — June 9

9:00 A.M.—Deformation Characteristics of Rubber or Rubberlike Compounds as a Measure of Quality, Especially in Control. ***Leslie V. Cooper (Firestone Tire & Rubber Co., Akron 17, Ohio).***

Ultimate tensile strength for a long time the yardstick of rubber compound quality is no longer adequate and often is impractical. Hardness, modulus at definite elongation, load deflection curves and various other deformation characteristics are more reasonable properties to evaluate. This paper will cover a discussion of hardness testers and their calibration, the use of modulus testing in control work and some notes of recent mechanical goods evaluations. The practical side rather than the theoretical aspect of testing will be stressed.

9:30 A.M.—Quality Control of Factory Mixed Batches of Rubber Compounds. ***P. E. Gnaedinger (Dominion Rubber Co., Ltd., Montreal, Quebec).***

Control chart methods can assist in controlling the uniformity of batches of compounded rubber stocks by improving interpretation of tests on measurable qualities, analyzing charts from process recorders, and providing a continuous record of various inspections.

Statistical theory plays an important part in the interpretation of data. Processed material by any test will vary, but if the variation arises from a constant system of causes, the variability will be uniform and confined to predictable limits above and below an average value. When observations fall outside these statistical limits (which may differ from specification tolerances) they are probably influenced by some unusual cause of variation and the test or material should be investigated further.

Thus the emphasis is shifted, for instead of simply accepting a given batch for further processing or rejecting it, the data is used as a test for homogeneity of the process. If a test indicates that a batch is significantly different from its predecessors, an attempt is made to find and remove undesirable causes.

This paper assumes some elementary knowledge of chart control techniques and avoids repetition of general procedures. By discussing typical applications from actual experience, it emphasizes results which can be obtained from the use of control chart methods.

10:00 A. M.—Oxidized Lignin as a Reinforcing Agent for Rubber. ***R. A. V. Raff and G. H. Tomlinson (Howard Smith Paper Mills Ltd., Cornwall, Ontario) and T. I. Davies and W. H. Watson (Polymer Corporation, Sarnia, Ontario).***

It has been found that alkali lignins, as separated from the spent digestion liquors from the alkaline pulping processes by conventional methods, give greatly enhanced reinforcing properties to GR-S, if the lignin is subjected to oxidation prior to its incorporation in the rubber masterbatch.

10:30 A.M.—Lignin as a Stabilizer in GR-S. ***W. H. Watson (Polymer Corporation, Ltd., Sarnia, Ontario).***

Lignin has been found an effective stabilizer for GR-S. As a stabilizer of the raw polymer, it is markedly superior to presently used antioxidants. As a stabilizer of the vulcanized compounds, it is at least as good as the best of the presently used materials. Lignin is a non-staining and non-discoloring stabilizer, which pigments the polymer only slightly. As a consequence, it can be used in light-colored compounds effectively.

11:00 A.M.—The Formation and Structure of Vulcanizates. ***J. A. Bardwell and C. A. Winkler (McGill University, Montreal, Quebec).***

Simplified methods of vulcanization and recently developed network theories have been used to determine the relation between vulcanizate structure and properties. A vulcanization technique which avoids most of the conventional compounding steps has been developed. Free radical attack on the polymer in emulsion particles results in a smooth cross-linking reaction which proceeds at a satisfactory rate at moderate temperatures. Although most of the investigation has dealt with butadiene-styrene copolymers (GR-S), the reaction appears to be general for diene polymers.

For a given chemical composition, two of the important structural elements would seem to be the concentration of cross-linkages and the molecular weight of the raw polymer. There is little agreement in either rubber theory or technology on the effect of these structural factors on vulcanizate properties—largely because of the difficulty of estimating the concentration of cross-linkages. The recently developed theory of gelation however relates this quantity explicitly to the solubility. On this basis it can be shown that less than one percent of the structural units in a typical vulcanizate are involved in cross-linkages.

The dependence of elastic modulus on concentration of cross-linkages is found to be linear when the molecular weight is fixed. The modulus however diminishes as the molecular weight is decreased. The effect is identical with that found by Flory for a series of fractions of butyl rubber. The dependence on molecular weight is believed to arise from the fact that each unbranched molecule eventually gives rise to two "loose ends" in the network structure. Such "loose ends" are flaws in the vulcanizate structure. Impairment of certain physical properties can be expected to depend on the number of such flaws, i. e., inversely on the average molecular weight.

11:30 A.M.—The Role of Aggregating Conditions and Particle Fusion in the Growth of Polymer Particles during Emulsion Polymerization. ***C. E. Rhines and J. McGavack (U. S. Rubber Co., General Laboratories, Passaic, N. J.).***

The theory that particle size will be proportional to the condition of stability existent in the polymerizing system enables one to regulate particle size very effectively and to predict the effects which various conditions or reagents will have on par-

ticle size. Destabilizing aids of various types favor large particle formation; stabilizing aids of various types favor small particle formation. The large amount of research and production experience has demonstrated the soundness of these views. The destabilizing conditions that lead to large particle formation may be brought about by: (a) Low soap content, (b) Poor soap, (c) Low pH, (d) Salts, particularly sodium salts and other stabilizers, (e) Low temperatures.

Wednesday Afternoon — June 9

2:30 P. M.—Vinyl Paste Technology. ***M. Scott Moulton (B. F. Goodrich Chemical Co., Cleveland, Ohio).***

This paper will concern vinyl paste formulating and processing, with special attention to recent improvements which have widened the field of usefulness of this form of resin.

A vinyl paste is a mixture of resin and plasticizer which is unique in being a liquid at room temperature and yet capable of conversion to a solid form by application of heat. In the process of "heat setting" there is no volatilization of liquid material, and as a consequence no shrinkage or blistering. Vinyl pastes, therefore, provide a means of shaping the plastic without recourse to heavy equipment or to use of volatile solvents.

English manufacturers have led in adapting these valuable properties to their needs and the speaker will show samples and describe operations he has witnessed in England. The new technique should be interesting to any manufacturer of vinyl products concerned with expanding his operations quickly and at moderate expenditure.

3:00 P.M.—Impact Resistant Rubber-Resin Blends. ***H. S. Sell and R. J. McCutcheon (Goodyear Tire & Rubber Co., Akron, Ohio).***

Moderate loadings of modified high styrene resin polymers are finding widespread use as reinforcing materials for rubber compounds. Investigations of compounds in the high resin-low rubber range have also produced many interesting properties. Among these are stocks which exhibit high impact resistance while maintaining the hardness and rigidity of the resin. These rubber-resin blends can be milled on conventional rubber equipment and compounded to improve properties such as hardness, stiffness, and abrasion resistance, and to obtain a wide range of colored stocks. This paper deals with the use of numerous rubbers as plasticizers, the physical properties which can be obtained with various rubber-resin ratios, and compounding variations in these stocks to improve specific properties.

3:30 P.M.—A Moisture-Insensitive Accelerator System for Elastomers. ***S. T. Bowell and N. R. Legge (Polymer Corporation, Ltd., Sarnia, Ontario).***

The effect of moisture on the cure rate of natural and synthetic elastomers introduces another variable in the vulcanization process, and serious proposals for complete humidity control of pigment storage, rubber storage, and compounding rooms have been put forward in an attempt to counteract this effect. A new approach is taken here—that of developing a curing recipe that is insensitive to concentration of moisture in the compounded stock, and which will give the same rate of cure for any amount of moisture present, within very broad limits. A successful accelerator combination is given, with the range of moisture content in which it has shown itself to be moisture-insensitive.

4:00 P.M.—Comparison of Synthetic and Natural Rubbers in Tires and Tubes, Footwear and Mechanical Rubber Goods. ***G. R. Smye (Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ontario), A. B. Lewis (British Rubber Co. of Canada, Ltd., Montreal, Quebec), and C. L. Brittain (Gutta Percha & Rubber Ltd., Toronto, Ontario).***

This is a combined paper by three authors representing three different branches of the Rubber Industry in Canada. A comparison of synthetic and natural rubbers is made from the point of view of the rubber manufacturers under the headings: Raw Properties, Processing Characteristics, Physical Properties and Quality of Finished Products.

5:00 P.M.—Water Soluble Phenol-Aldehyde Resins for Impregnating Woven Brake Linings and Asbestos Paper Clutch Facing. ***R. Destert (University of Montreal, Montreal, Quebec).***

A water soluble phenol-aldehyde resin has proven to be satisfactory for the manufacture of woven brake linings and paper clutch facings. Rigidity, color, friction were adequate. Brake squeal was absent. Resins of higher and lower friction were obtained by the same technical process. The modification residing in the relative molecular proportion of the chemical constituents.

Seaplane Floating Dock Utilizes Nylon-Coated Fabric Pontoons

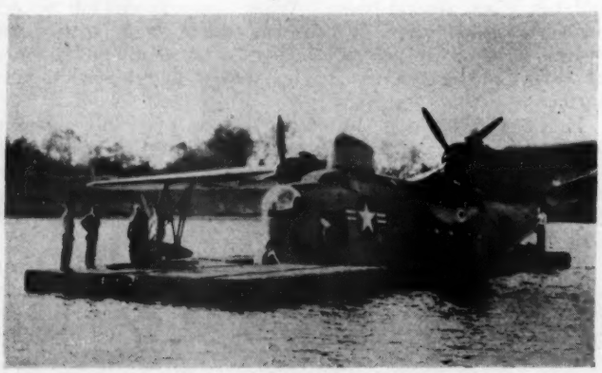
SEAPLANES of the United States Navy can now carry complete docking facilities along with them to advanced bases. An inflatable, rubberized fabric dock with plywood decking that is light enough for air transport, has been developed jointly by the Navy Bureau of Aeronautics and the Goodyear Tire & Rubber Company. The development grew out of a wartime need for docking facilities at advanced bases before the arrival of construction crews.

The new seaplane floating dock is constructed of nylon coated fabric pontoons covered with a marine grade plywood. Each pontoon is 25 feet long by seven feet wide and is constructed of four separate, cylindrical air chambers.

When completely assembled, nine of the pontoons are arranged together to form an elongated "U" shaped floating dock. Deck panels are hinged to provide necessary rigidity for unity while at the same time being flexible enough to undulate with water movement. Three units are inflated for the end of the huge "U" and three units are placed end to end for the extending legs. When completed, it is sufficiently large to accomodate the huge "Mars" flying boat.

Minor repairs could be made from the dock, but its primary function is to provide tie-up facilities for loading and unloading of cargo and personnel from seaplanes. The entire dock can be disassembled and carried in one airplane.

To provide necessary resistance to salt water deterioration and to provide a steady footing for handling crews the plywood deck panels are covered with a plastic impregnated paper and finished with Dektred, a rubber based safety footing developed by Goodyear. Deck area is 25 feet wide across the bow and 103 feet long on the sides.



Editorials . . . . . .

Study Group Meeting

ALTHOUGH the fifth meeting of the Rubber Study Group, held in Washington the week of April 26, did not result in any startling disclosures, it did serve to emphasize several important factors. Chief among these was the fact that if the United States Government carries through on its rather nebulous stockpiling plans, natural rubber will be in tight supply throughout the balance of the year, so tight in fact that if consumption continues at present levels there will have to be an increased use of GR-S to meet requirements.

As indicated in the report on the meeting elsewhere in this issue, the Group estimated world production of natural rubber in 1948 at 1,390,000 long tons and world consumption at 1,310,000 tons, of which 576,000 tons would be consumed by the United States and 205,000 tons by the United Kingdom. These figures indicate that there will be a surplus of only 80,000 long tons of natural rubber over expected consumption. It is not definitely known how much stockpiling the United States Government plans for the current year, but it is clear that if the estimates of production and consumption are fairly accurate and if any nation other than the United States has stockpiling plans of its own, there will not be much natural rubber left to meet the stockpiling plans of this country.

There are, of course, a number of factors which could throw the present estimates off considerably. The situation in the Far East, while improving, is still far from normal. There are constantly recurring reports of labor difficulties and strikes are known to have occurred on several large plantations, especially in Malaya. The situation in the Netherlands East Indies is still troublesome, although great strides toward normalcy are being made. Other minor factors must also be considered, such as the increased purchases being made by the Soviet Government. Reports from Singapore indicate that at the moment Russia is the largest single purchaser of Malayan rubber. It all adds up to the fact that although there will not be a famine in natural rubber this year, no feast can be expected.

Analysis of Rubber Act

AN EXCELLENT analysis of the Rubber Act of 1948 (Public Law 469) has been prepared by W. James Sears and Charles C. Miller of the Rubber Manufacturers Association. We urge all of our readers who may not have received a copy of this analysis to secure one at the earliest possible moment. The analysis not only explains the numerous sections of the Rubber Act but interprets its provisions and should serve to alert the rubber manufacturing industry to the potentialities of the Act. It points up the need for continuing cooperation and critical scrutiny of the Act's administration.

Under the law the President is given the authority to establish a "specified percentage" of the total estimated annual consumption of all types of rubber, in order to assure the minimum consumption of both general-purpose and special-purpose synthetic rubbers as provided by the law. The percentages established by the previous legislation, namely, 33-1/3% of the combined total of natural plus general-purpose synthetic rubber to be GR-S, and 4% of the combined total of natural, general-purpose and special-purpose synthetic rubber to be butyl rubber, are still in effect. The analysis points out that actual consumption for January and February of this year resulted in the use of 36.2% GR-S to the total of GR-S plus natural rubber and 5.2% butyl to the total of natural and all types of synthetic.

The law also provides that in establishing these "specified percentages" that the annual consumption of general-purpose synthetic shall not fall below 200,000 long tons and special-purpose synthetic not below 22,000 long tons. In this respect, the analysis points out that based on the average consumption for the first two months of this year, the annual consumption rate for GR-S is 371,868 long tons, all types of special-purpose synthetic 97,104 tons, and butyl 57,960 tons. It is evident, therefore, as the analysis points out, that based on the currently estimated supplies of natural rubber as against industry requirements at the present rate of use and the Government's stockpile requirements no substantial reduction in the rate of synthetic consumption can be anticipated this year.

CURRENT NEWS OF THE MONTH

INTERNATIONAL RUBBER STUDY GROUP HOLDS FIFTH MEETING AT WASHINGTON

THE Fifth Meeting of the Rubber Study Group was held in Washington, D. C., from April 26 to 29, under the chairmanship of Donald D. Kennedy, Chief, Division of International Resources, U. S. Department of State. The meeting was attended by delegates from Australia, Belgium, British Colonies, Burma, Canada, Ceylon, Czechoslovakia, Denmark, France, Hungary, Italy, Liberia, Netherlands, United Kingdom and the United States, and observers from the United Nations, Food and Agriculture Organization, Pan American Union and the International Bank for Reconstruction and Development. The Vice-Chairmen of the meeting were Mr. G. C. S. Corea of Ceylon and Mr. Denis Harvey of Canada.

In addition to Mr. Kennedy, the American representatives at the meeting included the following: E. G. Holt (Commerce Department), Earle S. Overly (O.I.T.), G. B. Hadlock (Rubber Reserve), P. W. Litchfield (Goodyear), H. S. Firestone, Jr. (Firestone), John L. Collyer (Goodrich), Herbert E. Smith (U. S. Rubber), Howard Jordan (Pennsylvania Rubber), Thomas J. Robbins (Hewitt Rubber), A. L. Viles (R. M. A.), and R. D. Young (R. T. A.).

Objects of the Meeting

The principal objects of the meeting were: (1) To examine the statistical position regarding production, consumption, and stocks of rubber throughout the world; (2) To review the world rubber situation in the light of the changes in that position since the Fourth Study Group Meeting, held at Paris in July, 1947; (3) To consider measures designed to expand world consumption.

The Group examined the statistical position and made estimates for natural rubber production and the total consumption of natural and synthetic rubber during the years 1948 and provisionally for 1949. During 1948 it was estimated that world production of natural rubber would be in the neighborhood of 1,390,000 tons while total consumption of natural and synthetic rubber might be in the region of 1,745,000 tons, of which about 1,310,000 tons would be natural rubber.

In regard to 1949 it was estimated that natural rubber production would be of the order of 1,550,000 tons while total consumption of natural and synthetic might again be 1,745,000 tons.

With regard to natural rubber latex, the Group estimated that the potential production for 1948, provided the increasing output is justified by demand, might be approximately 70,000 tons (dry rubber content). The following estimates for 1948 consumption of natural rubber latex were submitted: U. S. A., 28,400 tons; United Kingdom, 10,000 to 12,000; France, 5,000; other countries, 10,000 to 12,500. Total consumption, as indicated by these figures, is expected to be between 55,000 and 60,000 tons.

Tables giving the estimates made at the meeting are printed herewith. The Group felt the need for projecting its estimates beyond the current year, but warned that the figures for 1949 should be treated with the greatest caution.

There was an exchange of views on the subject of the price of natural rubber. The discussion covered the field of commodity agreements, government control of the sale and purchase of natural rubber, and special arrangements for the purchase of natural rubber by Governments from Governments for stockpiling at fixed prices. The conclusion was reached that the time had not arrived for any consideration or examination of a commodity agreement.

The Group continued its policy of examining all means for encouraging the expansion of the world consumption of rubber. It considers that every effort consistent with national security requirements should be made to ensure that exchange and trading in rubber should be freed. It again expressed the hope that maximum assistance would be given to the countries desiring to make an extensive use of rubber but which, on account of the war, cannot afford to pay in foreign currencies for the rubber imports they require.

The Group is of the opinion that only by a sustained and continued expansion of its use can the problems of rubber be permanently solved and that all well directed efforts towards that end should be supported and encouraged.

The Group accepted an invitation from the Government of the United Kingdom to hold their next meeting in Kuala Lumpur, in the Federation of Malaya, early in 1949. The British Colonies, Ceylon, France, the Netherlands, the United Kingdom, and the U. S. A. were appointed to form the Management Committee.

TABLE I - ESTIMATED NATURAL RUBBER PRODUCTION

(Thousands of Long Tons)

Territory	1948	1949
Malaya	675	700
Indonesia	370	460
Ceylon	90	90
Indochina	45	80
British Borneo	62	65
Burma	11	12
Liberia	25	27
Other Countries	113	113
Total	1,391	1,547

TABLE II - ESTIMATED NATURAL AND SYNTHETIC RUBBER CONSUMPTION

(Thousands of Long Tons)

Territory	1948 Natural	1948 Synthetic	1948 Total	1949 Total
U.S.A.	576	392	968	917
U.K.	205	5	210	225
France	93	9	102	117
Netherlands	12	—	12	14
Belgium	*	*	17	17
Czechoslovakia	*	*	16	16
Italy	*	*	28	30
Denmark	*	*	4	4
Hungary	*	*	3	3
Australia	*	*	24	25
Canada	33	20	53	49
Other Countries	*	*	308	330
			1,745	1,747

* Synthetic consumption not given separately, total synthetic consumption for all countries so indicated estimated at around 7,000 tons.

English Concern 100 Years Old

The firm of J. G. Ingram and Son, Ltd., Hackney Wick, London, England, is currently celebrating its 100th anniversary. Founded in 1847 by James George Ingram, the company originally manufactured toy balloons only, but today produces mechanical, surgical and sporting goods of all kinds. It is reported that in its early days the company often sought and secured the advice of Thomas Hancock. Geoffrey D. Ingram is the present chairman and managing director of the firm.

Third Foundation Lecture

The third Foundation Lecture of the Institution of the Rubber Industry will be given in Manchester, England, on June 18. The lecture, to be given by Dr. W. J. S. Naunton, who is also a Colwyn Medallist, will be entitled "Rubber Research, Rubber Investigations, and Rubber Empiricism." A dinner in honor of the lecturer will also be held.

DATA ON 1947 RUBBER IMPORTS ISSUED BY COMMERCE DEPARTMENT

According to an industry report issued by the Department of Commerce, the imports into the United States of rubber and such allied materials as jelutong, balata and gutta percha, and of rubber manufactures, were valued at $326,000,000 during 1947. This figure has been previously exceeded only in the stockpiling year of 1941, and in the 1925-27 period of high prices for rubber. The imports consisted 97% of natural rubber, over 2% of allied materials, and less than 1% of rubber manufactures.

Exports of rubber and rubber manufactures were valued at $211,000,000 and re-exports at an additional $3,000,000. Never in history has the international balance of payments on our entire foreign trade in rubber had so favorable a ratio as in recent years. The 1947 exports not only surpassed the 1946 figure of $181,000,000, but also the 1944 figure of $185,000,000 when synthetic rubbers accounted for 45% of the total, and when the figures were swollen by lend-lease shipments.

In 1947, transportation rubber goods constituted nearly two-thirds of the total exports and shipments of mechanical rubber goods an additional 13%. Exports of synthetic rubbers were but 3% of the 1947 total. Exports of rubber manufactures represented about 7% of the total volume of business done by the industry in 1947.

Value of Exports

Through the first half of 1947, the value of exports averaged $20,000,000 a month compared with a 1935-39 average of $29,000,000 a year. The exports declined during the last half of 1947 and in January of 1948. In July, 1947, the value of exports amounted to $16,705,316, in August, to $15,861,467; September, $14,250,239; October, $16,526,770; November, $13,798,468; December, $13,595,752. Value of exports in January, 1948, was $11,816,668.

The figure for January, 1948, is 56.2% of that for January, 1947, and is the first monthly total under $12,000,000 since the decline set in. In view of the dollar shortage abroad, it is surprising that the exports have not declined more rapidly. In 1947, the ten leading markets were Canada, Sweden, Argentina, Belgium, the Philippines, Venezuela, the Netherlands, France, Italy and Mexico. These ten countries took 48.6% of the total exports.

The rubber manufacturing industries outside the United States are back in volume production now and the need of foreign countries for imports of rubber manufactures continues to shrink. It is also probable that during the year export prices will decline somewhat. If the foreign manufacturers should increase their outputs as much as the United States exports decline in 1948, it would probably increase their total consumption of rubber by at least 30,000 tons.

The Department reports that the licensing of rubber products for export to European countries has been resumed. All applications should be directed to the Office of International Trade, Department of Commerce, Washington, D. C.

Coming Events

May 21. Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit, Mich.

May 27. Northern California Rubber Group.

June 5. Southern Ohio Rubber Group, Outing.

June 9. Rubber Division, C.I.C., Windsor Hotel, Mount Royal Hotel, Montreal, Canada.

June 18. Boston Rubber Group. Outing. Woodland Golf Club, Newton, Mass.

June 18. Akron Rubber Group, Outing, Lake Forest Country Club, Hudson, Ohio.

June 21-25. A.S.T.M., Annual Meeting, Book-Cadillac Hotel, Detroit.

June 23-25. Second Rubber Technology Conference, London, England. (Auspices of Institution of the Rubber Industry.)

June 24. R. I. Rubber Club. Outing. Pawtucket Golf Club, Pawtucket, R. I.

June 24. Northern California Rubber Group.

June 25. Detroit Rubber & Plastics Group, Outing, Forest Lake Country Club, Detroit, Mich.

June 26. New York Rubber Group. Outing. Doerr's Grove, Millburn, N. J.

July 17. Chicago Rubber Group, Golf Outing, Acacia Country Club, Chicago, Ill.

July 22-23. Rubber Division, A.C.S., Summer Meeting, Hotel Mayfair, Los Angeles, Calif.

July 24-25. Los Angeles Rubber Group. Outing. Catalina Island, Calif.

Aug. 24. New York Rubber Group. Golf Tournament, Winged Foot Golf Club, Mamaroneck, N. Y.

Sept. 10. Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit, Mich. (Tentative).

Sept. 17. Southern Ohio Rubber Group. Dayton, Ohio. (Tentative).

Sept. 24. Boston Rubber Group, Somerset Hotel, Boston.

Sept. 30. Northern California Rubber Group.

Oct. 1. Detroit Rubber Group. (Tentative).

Oct. 5. Los Angeles Rubber Group, Mayfair Hotel, Los Angeles, Cal.

Oct. 15. New York Rubber Group, New York, N. Y.

Oct. 28. Northern California Rubber Group.

Nov. 8-10. Rubber Division, A.C.S., Fall Meeting, Book-Cadillac Hotel, Detroit, Mich.

Nov. 18. R. I. Rubber Club, Crown Hotel, Providence, R. I.

Nov. 18. Northern California Rubber Group.

Dec. 7. Los Angeles Rubber Group. Xmas Party.

Dec. 9. Southern Ohio Rubber Group, Xmas Party, Miami Valley Country Club, Dayton, Ohio.

Dec. 10. New York Rubber Group, Xmas Party, New York, N. Y.

Dec. 10. Detroit Rubber & Plastics Group, Xmas Party, Detroit-Leland Hotel, Detroit, Mich.

Dec. 17. Boston Rubber Group, Somerset Hotel, Boston.

REVISE RUBBER ORDER R-1 TO CONFORM WITH NEW LAW

Revision of Rubber Order R-1 to bring it into conformity with the Rubber Act of 1948 (Public Law 469) was announced on May 7. The revised order will be administered by the Office of Domestic Commerce of the Department of Commerce. The Office of Materials Distribution, which has been administering the order for the past year, has been merged with the Office of Domestic Commerce. H. B. McCoy was director of both offices and continues as ODC director.

Principal feature of the revised order is reversal of the specifications for manufacture of tires, tubes, flaps and camelback, from a maximum natural rubber basis, to minimum synthetic rubber use. This reflects the intent of the new legislation to assure consumption of synthetic rubber in quantities sufficient to maintain a domestic rubber producing industry adequate for national security, and to allow for continued stockpiling of natural rubber by the Government.

Since cessation of hostilities, the old War Production Board conservation order has been progressively amended with these ends in view, and the new changes do not alter recent requirements for use of specified preparations of synthetic rubber in the manufacture of transportation items. Control over synthetic rubber content of these items merely becomes direct rather than indirect. It also was pointed out that specification formulas now are written in terms of synthetic and new rubber only, not total rubber content as formerly, and so do not affect current reclaimed rubber usage.

Removal of the last remaining control over natural rubber latex is effected by deletion from the order of specifications requiring use of some synthetic in the manufacture of certain sizes of seat cushions.

Weidlein Awarded Priestly Medal

Edward R. Weidlein, director of the Mellon Institute for Industrial Research, has been awarded the Priestly Medal by the American Chemical Society. The award was announced during the recent A.C.S. meeting in Chicago, Ill. Dr. Weidlein, a past president of the society, was cited for "distinguished services to chemistry." Long active in civic and scientific affairs, he contributed importantly during the war to the synthetic rubber program, to chemicals production, and to military research. The Priestly Medal is the highest honor in American chemistry.

Neutral Color Rubber Heels

Neutral color rubber heels and soles which harmonize with either brown or black shoes were announced recently by the U. S. Rubber Co. The new heels and soles are made of natural and synthetic rubber combined with plastics. New synthetic ingredients are used instead of carbon black in the manufacturing process, resulting in a rubber that will not mark floors. The new heels and soles are said to be long wearing and highly resilient.

RUBBER DIVISION, A.C.S., HOLDS ITS SPRING MEETING IN CHICAGO

The Spring Meeting of the Division of Rubber Chemistry, A.C.S., was held at the Sherman Hotel in Chicago, Ill., on April 21 to 23 in conjunction with the 113th National Meeting of the parent society. Approximately 750 members and guests were in attendance. The meeting featured the presentation of 28 technical papers, the presentation of the 1948 Charles Goodyear Medal, the inaugural luncheon of the Twenty-Five Year Club, a business session, the banquet, and the suppliers' cooperative cocktail party.

The technical sessions, again grouped by subject for convenience, an arrangement which has won the admiration of the entire Division, were especially well attended, even the final session held on Friday morning, April 23. Harry E. Outcault, manager of the zinc oxide department of the St. Joseph Lead Co., chairman of the Division, presided at all sessions. Abstracts of the papers presented appeared in the March, 1948, issue of RUBBER AGE.

R. C. Dale (Inland Rubber) acted as General Chairman of the Local Arrangements Committee, assisted on various arrangements by the following: *Banquet,* Francis Frost (Frost Rubber Works); *Meeting Rooms,* Robert F. Gerster (Inland Rubber); *Registration,* F. M. Bickel (Diamond Wire); *Information,* A. G. Susie (Marbon); *Publicity,* B. W. Hubbard (Ideal Roller). W. H. Peterson (Enjay) acted as treasurer and C. W. Baldwin (United Carbon) was chairman of the Suppliers' Cocktail Party Committee. Full credit goes to this group for the smoothness with which all arrangements were handled.

Inaugural Club Luncheon

The inaugural luncheon of the Twenty-Five Year Club of the Division was held at the Sherman on April 21, with Dr. H. A. Winkelmann, research director of Dryden Rubber, who handled most of the organizational details, presiding. Approximately 135 were in attendance at the luncheon.

In opening the "formal" proceedings, Dr. Winkelmann pointed out that the Rubber Divison was the first of the A.C.S. divisions to establish a twenty-five year group. He then turned the session over to Dr. R. P. Dinsmore, vice-president of the Goodyear Tire & Rubber Co., who called on a number of "old timers" to express their views with regard to the permanent formation of the club.

Among those expressing their views, all of them favorable for permanent formation of the Twenty-Five Year Club, were H. E. Simmons (Akron University), E. R. Bridgwater (DuPont), Norman Shepard (American Cyanamid), F. W. Frerichs (Cupples), George Oenslager, H. Trumbull (Goodrich), and Harry L. Fisher (U. S. Industrial Chemicals). At the conclusion of these brief talks, permanent formation was put to a vote and approved by a unanimous show of hands.

Dr. Dinsmore then announced the selection of various committees to handle the details of permanent formation. W. O. Hamister (Naugatuck Chemical) was named chairman of the committee to determine rules and regulations, with C. R. Haynes (Binney & Smith) and C. W. Christensen (Monsanto) as his associates. The committee to determine membership qualifications consists of Bruce Silver (N. J. Zinc) as chairman and J. P. Coe (Naugatuck Chemical), E. R. Bridgwater (DuPont), C. P. Hall (C. P. Hall Co.), and Dr. Winkelmann.

Since it is planned to have regular officers for the club, a Nominating Committee was named, consisting of E. B. Curtis (Vanderbilt) as chairman, and S. Cadwell (U. S. Rubber) and F. Malm (Bell Telephone Laboratories). It was also announced that W. G. Nelson (U. S. Rubber) will act as general chairman at the luncheon meeting of the club to be held in Detroit next Fall during the meeting of the Rubber Division.

During the luncheon session it was determined that many of those present had far more than twenty-five years of experience in the over-all rubber industry. Among those with 40 years of experience or more, in attendance at the luncheon, were the following: B. W. Henderson (American Cyanamid), George Oenslager, C. R. Haynes (Binney & Smith), R. E. Cartlidge (Midwest Rubber Reclaiming), and Dave Scott, Sr. (Scott Testers).

Business Meeting Is Held

The regular business meeting of the Division was held on the morning of April 22, with Chairman Outcault presiding. In connection with subsequent meetings, it was announced that the Summer Meeting to be held in Los Angeles on Thursday and Friday, July 22 and 23, will be a regular Division meeting rather than a regional meeting as originally planned. D. C. Maddy (Harwick Standard Chemical) is acting as Chairman of the Local Arrangements Committee for the Los Angeles meeting, which will be held at the Mayfair Hotel. The deadline for submission of papers for presentation at this meeting is May 25.

It was also announced that C. W. Selheimer (U. S. Rubber) will act as Chairman of the Local Arrangements Committee for the Fall Meeting to be held at the Book-Cadillac Hotel in Detroit on November 8 to 10. The Spring, 1949, Meeting, which will mark the 110th anniversary of the discovery of vulcanization by Charles Goodyear, will be held in Boston, and the Fall, 1949, Meeting in Atlantic City. The only one of the next four meetings to be held in conjunction with the parent society is the Fall, 1949, meeting. Under A.C.S. rules and regulations, divisions must meet with the parent society at least once each year.

A report from the Membership Committee headed by J. C. Richards (Goodrich Chemical) as chairman, indicated that since the last meeting of the Division a total of 152 regular members and 50 associate members had joined the Division. Also, the committee has secured 33 new members for the parent society. Chairman outcault named a new Nominating Committee to present a slate of officers for the forthcoming 1948-49 season consisting of Harold Gray (Goodrich) as chairman, and R. F. Dunbrook (Firestone), C. P. Hall (C. P. Hall Co.), J. W. Temple (U. S. Rubber), and J. T. Blake (Simplex Wire).

It was announced during the business session that Dr. Harry L. Fisher has been selected to receive the Charles Goodyear Award for 1949. Dr. Fisher will deliver the Goodyear Lecture at the Spring, 1949, Meeting of the Division at Boston. It was also stated that the Southern Ohio Rubber Group is now officially being sponsored by the Divison, which means that all local rubber groups are now under such sponsorship except the recently-organized Washington Rubber Group. A brief report on the progress being made by the Division-sponsored rubber library at the University of Akron was made.

Banquet Is Well Attended

Some 800 members and guests were in attendance at the banquet, which was held in the Sherman on Thursday evening, April 22. Following an unusually good dinner, Chairman Outcault introduced three of the previous Goodyear Lecturers who were present, these being Dr. L. B. Sebrell (Goodyear), Dr. Waldo L. Semon (Goodrich), and Dr. Ira Williams (Huber). Reference was also made to the fact that Dr. R. P. Dinsmore (Goodyear) had been awarded the Colwyn Medal by the Institution of the Rubber Industry.

An unusually large number of past divisional chairmen were in attendance at the banquet, and each of them was asked to stand up by Mr. Outcault. They included Messrs. Dinsmore, Fisher, Winkelmann, Bridgwater, Sebrell, Williams, Cadwell, Shepard, Trumbull, Kemp, Hinshaw, Curtis, Gerke, Blake and Vogt. The current officers and directors of the Division, as well as committee chairmen, were also introduced.

Special tribute was paid by Mr. Outcault to the four secretaries and treasurers who have served the Division since its inauguration, some of them serving in a dual capacity. These included Messrs. Simmons, Christensen, Cramer and Haynes. Note was also paid to the fact that Dr. C. C. Davis (Boston Woven Hose) has acted as editor of *Rubber Chemistry & Technology* for the past 20 years and to the work of S. G. Byam (DuPont) as advertising manager of that publication for the past 15 years. It was announced that Mr. Byam had resigned his duties as advertising manager, and that Emil Krissman, also of DuPont, will henceforth act in that capacity. The first advertising manager of *Rubber Chemistry & Technology* was E. R. Bridgwater of DuPont.

Oenslager Awarded Goodyear Medal

The highlight of the banquet was the formal presentation of the Charles Goodyear Medal to Dr. George Oenslager, the 1948 medalist. The medalist was presented to Chairman Outcault by W. W. Vogt, chairman of the Charles Goodyear Lecture Committee, and Mr. Outcault made the actual presentation of the medal and the accompanying award of $200.00. Dr. Oenslager received the award for his work

in connection with the development of organic accelerators while with the Goodrich organization. He still acts in a consulting capacity with that company.

Dr. H. E. Simmons, president of the University of Akron, delivered a short address on 'George Oenslager, the Man." He included a number of anecdotes in his talk concerning Dr. Oenslager, among them being the fact that when Dr. Oenslager attended Harvard University he was advised not to study chemistry "because the field is already overcrowded." Dr. Oenslager was graduated from Harvard in 1894 and remained as an instructor in organic chemistry for two years following his graduation.

Dr. Simmons reviewed the work on organic accelerators pioneered by the medalist, which resulted in tire cures being cut down from three hours to one hour, and also told of some of his early experiments with the use of carbon black in tire compounding. He remarked on the fact that Dr. Oenslager is widely traveled and praised him for his numerous philanthropies. He referred to some of the previous honors won by the medalist, including the Perkin Medal awarded to him in 1933.

Prior to the banquet, the Suppliers' Cooperative Cocktail Party was held and, as usual, attracted a large turnout. This was the third cooperative effort of the suppliers and was marked by excellent facilities. Cooperating on the Arrangements Committee in addition to C. M. Baldwin, the chairman, were W. N. Crumpler (C. K. Williams), S. A. Davis (C. P. Hall), J. P. Sheridan (N. J. Zinc), W. O. Hamister (Naugatuck Chemical), and J. A. Myers (United Carbon).

Other Papers of Interest

In addition to the papers delivered before the Rubber Division there were a number of other papers given before other divisions of direct interest to rubber technologists. Titles, authors and abstracts of several of these papers follow:

Electrophoretic Mobility of Type III GR-S Latex, by Samuel H. Maron and William W. Bowler, Case Institute of Technology, Cleveland, Ohio (delivered before Division of Colloid Chemistry): A study has been made of the electrophoretic mobility of Type III GR-S latex, and of the effect of various factors upon it. The technique employed was that used by Maron, Turnbull, and Elder [*J. Am. Chem. Soc.,* 70 (1948)] The factors investigated were total solids content, pH, ionic strength, temperature, and soap content.

The mobility was found to be independent of latex concentration at solids contents of 9 to 15 grams per liter in presence of Na_2HPO_4 as the added electrolyte. As with Type II latex, pH exercised a pronounced effect upon mobility and so did the ionic strength. At any given pH the mobility decreased essentially linearly with ionic strengths from $\mu = 0.05$ to $\mu = 0.20$, and increased linearly with temperature between 15° and 40°C. The mobility-temperature data were used to evaluate zeta potentials at various temperatures.

An interesting observation made was that addition of the potassium soap of K-wood rosin to the latex led to a linear decrease in mobility with concentration of added soap, even at concentrations in excess of those required for surface saturation of the rubber particles with soap. In all probability this decrease in mobility is the result of electrolyte effects exercised by the added soap.

Adsorption of Helium on Carbon Black at Liquid Helium Temperatures, by W. D. Schaeffer, W. R. Smith, and C. B. Wendell, Godfrey L. Cabot, Inc., Boston, Mass. (delivered before Division of Colloid Chemistry):

Adsorption isotherms for helium on two nonporous channel carbon blacks of different particle size have been measured at 4.2°K.

The helium isotherms obtained on both blacks were of the sigmoid type, and gave linear BET plots. The volume of helium at 4.2°K. required to fill the monolayer, V_m, was some 2.4 times that observed for N_2 at 78°K. The cross-sectional area of the helium atom, as calculated from the liquid density, is 15.4 $Å.^2$, a value close to 16.2 $Å.^2$, similarly calculated for the nitrogen molecule. Assuming the 15.4 $Å.^2$ area correct for the helium atom suggests a much greater portion of the total surface available to helium than nitrogen. However, the fact that the ratios of the V_m values for nitrogen and helium remain nearly constant for the two carbon blacks studied suggests the more plausible interpretation, that when absorbed the helium atoms are not packed as in the liquid state.

Employing the areas calculated from the nitrogen BET plots, which are in substantial agreement with the electron microscope values, a cross-sectional area of 6.8 $Å.^2$ is calculated for the adsorbed helium atoms. This value is smaller than that calculated for solid packing, but is in substantial agreement with the van der Waal's b value.

Assuming that the entropy of the adsorbed helium is negligible, it is possible to calculate the heat of adsorption of helium on carbon blacks. At the completion of the monolayer, values of 64 calories per mole are found for each black. The values calculated from c in the BET expression are in close agreement.

Contributions of the Polymer Chemist to the Plastics and Coating Industries, by C. S. Fuller, Bell Telephone Laboratories, Murray Hill N. J. (delivered before the Division of Paint, Varnish and Plastics Chemistry): The production of synthetic organic polymers today in the United States amounts to about 3 billion pounds annually. This is about 15 per cent, when calculated on a volume basis, of the total steel production of the country. It represents a truly huge chemical effort directed toward polymer synthesis. Furthermore, the rate of growth of the synthetic materials industry exceeds that of any other basic materials industry.

Industrial growth is the result of numerous factors: invention and development of new materials and processes, availability of cheap raw materials, ability to show an enlarging profit, accumulation and exchange of technical and research information.

We are not concerned in this discussion with the development of raw materials and intermediates for the coatings and plastics industries over the past 25 years, although much laudable effort on the part of the chemist might be recounted in this field. Nor are we concerned with the development of processes, either chemical or mechanical, on which these industries depend.

Inaugural luncheon of the Rubber Division Twenty-Five Year Club held at the Hotel Sherman, Chicago, April 21, 1948

Here too, particularly in the plastics industry which has depended to a large extent on the development of molding techniques, an interesting story could be told. Rather we confine ourselves to a discussion of the part research and development work have played in this growth, specifically, the contributions the polymer chemist has made and is making in helping to create new materials having inherently useful properties.

Organosodium Compounds, by Avery A. Morton, Massachusetts Institute of Technology, Cambridge, Mass. (Delivered before Division of Physical and Inorganic Chemistry): The limitations of the principal methods of preparing these compounds are reviewed. The physical behavior of the compounds as salts of hydrocarbon acids is described and the insolubility of the more reactive of these salts is emphasized. A brief review of the chemical reactions which these compounds have for some time been known to undergo includes acid-salt interchange, metathesis with organic halides, addition to carbonyl and certain olefin systems, cleavage of ethers, and polymerization of dienes by formation of a series of adducts.

The more recent developments in the field of chemical reactions are along two lines: first, the metalation of olefins and certain aromatic compounds and, second, the catalytic polymerization of dienes to high molecular weight by the Alfin catalysts.

The metalation of olefins includes the results on about fifteen different compounds. Preparation and properties of vinylsodium are described. The polymerization studies show the special results obtained when the alkenylsodium is combined with a sec.-alkoxide. The effect of the metalation which simultaneously occurs is discussed. Finally the manner by which the organosodium compounds react is discussed.

The original supposition that free radicals were present during the formation and reactions of these compounds is shown to be unnecessary. The activity as ion pairs and the strong influence of the cation are shown to explain all facts connected with the behavior of these reagents.

Refuse Standard Oil Appeal

The appeal of four Standard Oil companies for a rehearing of the decision of the Second Circuit Court of Appeals with regard to the recovery of certain properties seized by the United States Alien Property Custodian was denied by the Supreme Court on April 19. The four companies involved are the Standard Oil Co. (New Jersey), Standard Oil Development Corp., Standard Catalytic Co., and Jasco, Inc. Several hundred oil and chemical patents and blocks of stock in American corporations are involved. Standard Oil failed in most of its claims in the lower courts. Throughout the period of these suits, the Custodian has contended that the properties in question belonged to I. G. Farbenindustrie, while Standard Oil has maintained that it had obtained these properties in good faith in a series of transactions beginning in 1929. Several of the Buna S patents were involved.

Carbon Black Record

The rubber industry spent approximately $40,550,000 last year to buy a record amount of carbon black and channel black for use in rubber products, according to the B. F. Goodrich Co., Akron, Ohio. Purchases of blacks hit a new peak because of the domestic consumption of 1,120,000 long tons of rubber, a figure exceeding even that of the war years, the company said. The rubber industry bought about 95% of all carbon black sold in the United States. The rubber firm noted that carbon black may eventually be replaced in many applications by "white carbon black," a white powdery material which it discovered in 1946. Carbon white, the company stated, will permit the manufacture of rubber in any desired color without impairing the toughness of the product.

Mark To Deliver Howe Lecture

Professor Herman F. Mark of the Polytechnic Institute of Brooklyn, noted authority on the chemistry of rubber, plastics and wood, has been chosen to present the fourth Harrison Howe Lecture sponsored by the Rochester, N. Y., Section of the American Chemical Society. The Harrison Howe Lecture Series was established three years ago in memory of the late Dr. Howe, who from 1921 until his death in 1942 was editor of *Industrial and Engineering Chemistry,* a publication of the American Chemical Society. For his lecture, Professor Mark will report on latest developments in wood chemistry in North America. The lecture will be given next November.

Tire Diamond Jubilee

The diamond jubilee of the pneumatic tire was recently celebrated at the original premises in May Street, Belfast, Ireland, where the first such tires were developed and produced by John Boyd Dunlop. Wreaths were placed on the memorials located at the Belfast premises and at Fort Dunlop in England. The latter wreath was placed by Robert Carlisle, now 84 years old, who helped Dunlop make the first pneumatic tire. Mr. Carlisle is the oldest member of the Dunlop organization.

Auction Old Town Equipment

The land, buildings, machinery and equipment of the Old Town Rubber Corporation at Old Town, Maine, were sold at public auction on April 27. The equipment included molding presses, extruders, trimming machines, accumulators, punch presses, etc. According to Aaron Krock & Co., auctioneers of Worcester, Mass., who conducted the sale, the entire assets of the company were sold in piecemeal lots.

SIX-POINT PREPAREDNESS PLAN OFFERED BY JOHN L. COLLYER

A six-point "program for preparedness" in rubber has been proposed by John L. Collyer, president of the B. F. Goodrich Co. In an analysis of the national and world rubber situation—the eleventh in a series of rubber studies the company has issued since July, 1940—the following steps are suggested for consideration by the government:

(1) Immediate study of availability of all the components necessary to making American rubber again on a large scale—"to avoid serious conflicts, in an emergency, with other essential production programs which might require the same materials."

(2) Determination of the types and quantities of rubber products that would be needed in an emergency, and the conditions under which such products would be required to operate—"so that competitive development and engineering can be intelligently directed toward solution of military product and supply problems."

(3) The framing of a "rubber mobilization plan" which, should war occur, would assure the rapid conversion of the industry to military and essential civilian production and the large-scale use of American rubbers.

(4) The increasing of current working stocks of American rubbers, and continuing additions to the strategic stockpile of crude rubber as supplies become available.

(5) Early dissolution of the wartime patent pool in man-made rubber know-how ——"a move that would at once turn the full power of competitive research and development to the improvement of existing rubbers and the invention of new, better and lower-cost rubbers."

(6) The exertion of the government's influence toward maintenance of a free world market in rubber and "against the resumption of cartels or other programs that would restrict crude rubber production."

Subject of Allocations

Mr. Collyer said "we are primarily concerned with the need for taking all possible steps to avoid delay and confusion in the actual work of putting American rubber production back onto a large scale, should that become necessary. Prudent allowance should be made for the fact that, should such a situation arise, other industries also would be on an emergency basis and there might again be conflicts and rivalries in the allocation of materials and feed stocks, such as the ones involving high-octane gasoline and American rubber during the last war. The charting of such allocations should be done now instead of waiting until an emergency has struck."

Mr. Collyer pointed out that many of the study's recommendations concern the early implementation of the recently enacted "Rubber Act of 1948," and that the program was designed to help chart the most effective course for the nation, within that framework, in terms of (1) immediate security; (2) long-range security, and (3) development of "a free and strong American-rubber-making industry."

PROGRAM DETAILS COMPLETED FOR DIVISION'S L.A. MEETING

Program details for the Summer Meeting of the Division of Rubber Chemistry, A.C.S., which will be held in Los Angeles, Calif., on July 22 and 23, have been announced. Headquarters for the meeting will be the Mayfair Hotel, and the first session is scheduled to start at 10 A.M. on Thursday, July 22.

D. C. Maddy, of the Harwick Standard Chemical Co., 1248 Wholesale St., Los Angeles 21, Calif., is Chairman of the Local Arrangements Committee, and will arrange hotel accommodations for members and guests desiring to attend. The Division banquet will be held at the Biltmore Hotel on Thursday evening, July 22. The banquet is under the chairmanship of C. H. Churchill. Mr. Churchill is also acting as chairman for the two-day outing of the Los Angeles Rubber Group which will follow the Division meeting. All members and guests have been invited to attend this outing.

Although a number of papers have already been received for presentation at the Los Angeles Meeting, additional papers will be welcomed by the Division. Abstracts in triplicate of 200 to 250 words describing proposed papers must be submitted to the Secretary of the Division before May 25. They should be sent to C. R. Haynes, c/o Binney & Smith Co., 41 East 42 St., New York 17, N. Y.

Biggs Boiler Works Sold

The Biggs Boiler Works, Akron, Ohio, recently began operation under new owners and management. Three eastern industrialists purchased the stock of the pioneer Akron company. They announced that there would be no noticeable change in either the nature of the company's business or in its personnel. The new owners are T. Hall Keyes, board chairman; K. McKinley Smith, president, and T. E. Krizanek, executive vice-president and general manager in charge of operations. All are from New York City. Byron R. Barder, one of the original incorporators of the company in 1900, and a principal owner, will remain in an advisory capacity. The company manufactures virtually anything where heavy steel or boiler plate is required including vulcanizers and devulcanizers for the rubber industry.

Koroseal Film for Yarns

A new family of fabrics in which Koroseal film is used to cover the yarns instead of as an over-all coating was announced recently by the B. F. Goodrich Co. Glass yarns are the core in the new fabrics, but other filaments such as nylon, rayon, cotton, silk, wire and twisted paper can be used. The Koroseal coating is said to provide greater abrasion resistance and colorability, and will pass any flame-resistance specifications. Koroseal treated fabrics are already available to processors in the field of draperies and upholstery, shoe materials, women's and men's accessories and others.

White Joins Rodic Rubber

John H. White, Jr.

John H. White, Jr., has been appointed vice-president and general manager of the Rodic Rubber Corp., New Brunswick, N. J., manufacturer of rubber rolls, sheets, extrusions, bonds, molded items and other industrial products. Mr. White was formerly Chief of Administration and Manufacture at Picatinny Arsenal, N. J., with the rank of Colonel in the U. S. Army. Previously, he was director of sales promotion for the American Gas Association and also owned and operated the Hamlin Canning Co., Inc., of Rochester, N. Y. In his new post, Mr. White will direct the production and sale of numerous standard and special rubber items for mechanical and industrial use.

Werkenthin Takes on Added Duties

In line with the increasingly close relation between rubber and petroleum, Theodore A. Werkenthin, Principal Materials Engineer, Civilian-in-Charge of the Rubber Subsection of Research and Standards, Bureau of Ships, Navy Department, Washington, D. C., has been assigned additional duties as Civilian-in-Charge of the Special Fuels Section of the same research and standards branch. The Special Fuels Section is responsible for research on petroleum, synthetic and special fuels, hydraulic oils, greases, lubricants and additives, etc.

Goodyear Resumes 6-Day Week

Production of tires by the Goodyear Tire & Rubber Co. was returned to a six-day weekly basis starting April 24. Output in most tire departments had been on a five-day basis for several months. E. J. Thomas, president of the firm, attributed the need for an extra day's work to continuation of automobile production at a high rate in Detroit and to an earlier surge in spring driving. Replacement sales are also increasing, with greater demand for new low-pressure, super-cushion tires, he said.

CASINGS SHIPPED IN FEBRUARY DECLINED FROM PREVIOUS TOTALS

Manufacturers' shipments of car and truck and bus casings declined 13.73% to 5,106,335 units in February, as compared with 5,919,026 units shipped in January according to a report released by the Rubber Manufacturers Association. Shipments of passenger casings amounted to 4,016,756 units in February, as against 4,737,098 units in January. During the same period, truck and bus casing shipments declined to 1,089,579 units from 1,181,928 units.

Total automotive casings produced in February were 6,385,394, as compared with 7,850,922 units produced in January. Passenger car casings produced in February totalled 5,109,722 units, against 6,438,955 units in January. Truck and bus casings produced in February amounted to 1,275,672 units, compared with 1,411,967 units in January.

A total of 4,505,317 passenger and truck and bus tubes were shipped in February, against the 5,152,463 units which were shipped during January. In the same month, 4,979,609 tubes were produced, against 6,225,651 units produced in January.

Wage Talks Being Held

Representatives of the Goodyear Tire & Rubber Co. and the United Rubber Workers (CIO) were scheduled to start a series of negotiations on the union's request for an increase of 30-cents-an-hour on May 10. The Goodrich negotiations are scheduled to start in Philadelphia on May 24. Bargaining with both companies will be on a company-wide basis, according to union officials. Negotiations with U. S. Rubber are expected to begin in New York City about June 1. A meeting with Firestone officials has already been held. The recent request of the U.R.W. to negotiate a wage increase on a "Big Four" basis was turned down by the rubber companies. The negotiations come at a time when several of the larger companies, including Goodyear, Firestone and Seiberling, have resumed the six-day week. Several of the smaller tire companies, however, including Pharis, have announced large wholesale lay-offs.

Another G.E. Price Reduction

Another major reduction in prices of products of the General Electric Co., the second in 1948, was announced recently by Charles E. Wilson, president. The latest reduction, a flat 5 per cent, was effective April 16, and applies to certain lines of Apparatus Department products on which the company does an annual business of close to $200,000,000. Products affected by the new reduction are fractional-horsepower motors, switchgear, conventional distribution transformers, lightning arrestors, feeder regulators, cut-outs and power capacitors. Price cuts were attributed to increased volume and more efficient facilities and manufacturing methods.

SEVERAL NEW PROJECTS LAUNCHED BY ASTM RUBBER COMMITTEE D-11

Several new projects were launched at the meeting of Committee D-11 on Rubber and Rubber-Like materials of the American Society for Testing Materials, and twenty of its subcommittees during A.S.T.M. Committee Week, held in Washing, D. C., from March 1 to 5. Included were programs of work on two new and important subjects, namely, thread rubber and rubber latices.

At the organization meeting of the new Subcommittee on Thread Rubber it was decided to develop test methods for the physical characteristics of rubber thread. First consideration will be to test for determining size, modulus or strength, and permanent set. A cooperative study of these three tests will be made by four laboratories.

The Subcommittee on Rubber Latices, organized in Philadelphia on December 10, 1947, held a two-day meeting and decided to confine the work at first to natural latex. There was a thorough consideration of specifications for creamed and centrifuged latex. There is urgent need for these specifications due to the establishment of a number of new sources of rubber following the war, and specifications will assist in the production of a latex of suitable quality.

The proposed requirements cover sampling, determinations of total solids, dry rubber content, alkalinity, viscosity, sludge, odor, procedures for copper and manganese, etc. A number of reports were submitted on studies of chemical and physical tests on liquid latex and also latex in solid form.

Activities of Other Sub-Committees

The Technical Committee on Automotive Rubber, which is under the joint auspices of A.S.T.M. and S.A.E., considered problems dealing with the application of rubber to automotive and aeronautic equipment. Action was taken to submit as tentative a new Method of Test for Volume Resistivity of Electrical Conductive Rubber and Rubber-Like Materials. Decision was also reached on revisions in the Methods of Testing Automotive Air Brake and Vacuum Brake Hose (D-622). Work is under way on specifications and tests for bumpers, rubber mats, and vacuum brake hose.

The Subcommittee on Insulated Wire and Cable completed new specifications for thermoplastic sheaths which are recommended as tentative. Other subjects under consideration are standards for thermoplastic insulated appliance wire and rubber insulated appliance wire. An electronic method for determining ozone is to be investigated for use in testing wire insulation.

The Subcommittee on Packings will continue its studies of a procedure for determining the tendency of compressed asbestos gaskets to corrode adjacent metal surfaces. In cooperation with other D-11 subcommittees, specifications are in preparation for compressed asbestos sheet and for rubber sheet packing.

Revisions were completed in the Tentative Specifications for Friction Tape for General Use for Electrical Purposes (D-69), and the Specifications for Rubber Insulating Tape (D-119).

An important assignment given to the Subcommittee on Physical Tests was the development of tests for determining coefficient of friction between rubber and other surfaces. This property is especially important for such materials as heels and soles of shoes, flooring materials, and tires.

Work in the Subcommittee on Chemical Analysis includes procedures for GR-S-natural rubber determinations, methods for reclaim analysis, and procedures for determining plasticizers in rubber used in contact with gasoline.

The Abrasion Subcommittee submitted revisions in the Standard Method of Test for Tear Resistance of Vulcanized Rubber (D-624). Studies made of the deviations of profile of edges of died-out rubber specimens have been completed and are being described in an article it is hoped to publish soon. A task group is conducting tests on analysis of factors affecting road wear of tires and the correlation of road wear with laboratory tests.

The Subcommittee on Life Tests presented a report on aging of GR-S which is to be published. Further study of the aging of GR-S is being continued and it is planned to hold an informal discussion on this subject at the June meeting in Detroit. This subcommittee also has under way a program in eight laboratories on the study of air oven aging methods. Other matters being given attention include the effect of ozone aging and the effect of light.

The Subcommittee on Hard Rubber reviewed data submitted by six cooperating laboratories on tests of high, medium, and low quality stocks. Further tests will be made on samples from standard formulas in order to determine the degree of reproducibility of the methods being studied.

The Subcommittee on Coated Fabrics has been giving attention to various types of abrasion test methods. A great deal of work is necessary on this subject, especially with regard to standardization. The round-robin on scrub and flex tests of coated fabrics is continuing and various types of scrub testers are being studied.

Data on Processibility Tests

A relatively new activity in Committee D-11 is the work being done by the Subcommittee on Processibility Tests. Two methods, covering the Test for Plasticity and Recovery by the Parallel Plate Plastometer (D-926) and the Test for Viscosity by the Shearing Disk Viscometer (D-927), were recently published as tentative. A new Tentative Method for Determining Scorch Time Using the Mooney Plastometer has been completed and will be submitted to letter ballot.

Another new activity is that on resilience tests. The first method to be completed has just been published as tentative under the title of Test for Mechanical Properties of Elastomeric Vulcanizates Under Compressive or Shear Strains by the Mechanical Oscillograph (D-945). Other matters under consideration are forced vibration and torsional vibration.

The Subcommittee on Low-Temperature Tests recommended for publication as tentative a torsion test for low-temperature set measurements.

Adhesive Committee Also Meets

Committee D-14 on Adhesives also held meetings during the week, with considerable activity shown as indicated by the several subcommittee reports.

The Subcommittee on Strength Tests reported that a shear test was nearing completion, that round-robin tests are in progress on flexure specimens and a recommended practice for fatigue testing cantilever beams is ready for subcommittee ballot.

The Subcommittee on Tests for Permanency is revising the Test Method for Resistance of Adhesive Bonds to Chemical Reagents (D-896) to include a screen test. Round-robin tests are being conducted on the present Recommended Practice for Determining the Effect of Artificial (Carbon-Arc Type) and Natural light on the Permanence of Adhesives (D-904).

The Subcommittee on Working Qualities has agreed upon a modification of the Green Tack Meter to be built for round-robin tests to determine tack properties and has accepted a proposed method for determining consistency. A third set of definitions and nomenclature relating to adhesives has now been reviewed and will be submitted to letter ballot of the main committee.

The subject of shear testing was the principal item in the report of the Research Subcommittee and a section was authorized to work on the problem of developing a test which will give the true shear characteristics of an adhesive. Announcement was made of the organization of a new Subcommittee on Electrical Properties.

Changes at Pioneer Rubber

Jack H. Gibson, of the Pioneer Rubber Co., Willard, Ohio, was elected president of the company at a meeting of the board on March 15, succeeding his father, J. C. Gibson, who was appointed chairman of the board. At the same meeting, C. R. Clark was appointed second vice-president in addition to his present duties as general manager. LaVern Pagel was appointed assistant secretary to act in the absence of K. L. Milligan, who is away because of his health.

Army Produces Special Compound

The Signal Corps Engineering Laboratories at Fort Monmouth, N. J., recently announced that it has successfully produced rubber compounds which will remain flexible at sub-zero temperatures. The need for synthetic rubber impervious to cold was pointed up, it was explained, by the cracking of rubber parts in military equipment in the Arctic. The Army engineers hope to procure rubber that will remain flexible at —67° F.

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PHILADELPHIA HEARS THOMPSON ON MACHINERY DEVELOPMENTS

The Philadelphia Rubber Group meeting held on April 16, at Kugler's Restaurant, Philadelphia, Penna., was addressed by E. S. Thompson, Manager, Rubber and Plastics Machinery Sales Division, Farrell-Birmingham Co., Inc., Ansonia, Conn. The subject of Mr. Thompson's address was, "Recent Developments in Rubber and Plastics Machinery."

The speaker stated that by admission of most qualified observers there has been too little progress during most of the 100 year span in rubber and plastics equipment design. The fact remains that, because of competition, over-all economic conditions, or a comparison with progress in other industries, rubber and plastics producers now appear extremely receptive to new ideas.

Mr. Thompson said that recently the importance of specialized designs to meet the specific requirements of a given application have come to be recognized. Following are some of the factors which must be considered in addition to the purely mechanical questions of speed and powers:

(1) The conservation of space, particularly with new building costs at their present level.

(2) The anticipated operating temperatures.

(3) The importance of roll surface temperature control.

(4) The necessity for frequent variation in roll nip opening.

(5) The metallurgical requirements on rolls, guides, pan, etc., as determined by chemical characteristics of the product.

(6) The probable frequency of cleaning.

(7) The inter-relationship of the mill and other equipment in the over-all process.

(8) The possible desirability of variable friction ratio.

Mr. Thompson spoke of the particular problems involved in the design of particular equipment such as mills, mixers, calenders and extruders. The background, application and future possibilities of these and other pieces of rubber and plastics equipment were discussed. Problems of production and the accomplishments of more or less analogous unit operations in other fields were also discussed.

Mr. Thompson stated in conclusion that progress must be the joint responsibility of equipment manufacturers and users. The future of both depend on adequate liaison and a spirit of genuine cooperation. There will be a defensive resistance by management to radical changes involving greatly increased capital and unproved theories, the speaker stated. The manufacturer must rely on technicians to define the objective and contribute practical experience to its solution.

The user, on the other hand, is justified in expecting an understanding of his problems, a willingness to pioneer, and an ability to contribute based on analogous experiences. The product of such a relationship must be a thoroughly analyzed "calculated risk" which can be conscientiously recommended and "sold to management."

CLAYS FOR RUBBER FEATURES NORTHERN CALIFORNIA MEETING

Approximately 40 members and guests attended the April 29 meeting of the Northern California Rubber Group held at the Claremont Hotel, Berkeley, Calif. Principal speaker for the evening was Lou F. Gongwer, manager of the Development Department of the J. M. Huber Corp. at Borger, Texas. Mr. Gongwer spoke on the subject "Clays For Rubber."

The simplest form of clay is $Al_2O_3(SiO_2)_2X2H_2O$ and is known as kaolin or china clay, Mr. Gongwer stated. Complicated clays such as bentonite have a higher ratio of alumina to silica. The latter clays become sticky in water, whereas the former remain dry. Clays are also characterized as being hard or soft. The main difference is particle size, hard clays having a smaller particle size.

The particle shape is the same for both types, a hexagonal plate. Hard clays stiffen uncured and cured rubbers more than soft clays and give higher tensile strength, abrasion resistance and tear strength than soft clays, the speaker stated. Soft clays have the advantage of being usable in higher loadings, giving faster extrusion of highly loaded stocks, being a lighter color, and yielding stocks having a higher resilience and lower permanent set.

Water-washed clay is generally used when stocks are extruded at high speed, such as wire insulation, or in complicated shapes, such as refrigerator gaskets, since mica, which causes "build-up" on the die, has been removed by the washing operation. Good soft or hard clays show up to 3½% residue on a 325 mesh screen. A new method of determining grit uses peptized slurry of clay prepared in a malted milk mixer. Grit in clay is particularly undesirable to manufacturers of heels and soles since it dulls the knives used for trimming, Mr. Gongwer concluded.

At a business meeting preceding the talk, Grover Ramsey (Goodyear), Herman J. Jordan (DuPont) and Robert R. James and Arthur E. Barrett of the Rubber Laboratory, Mare Island Naval Shipyard, were nominated as candidates for Director of the Rubber Division, ACS. A social session consisting of varied entertainment concluded the evening. The next meeting of the group is scheduled for May 27, in Oakland, Calif.

RHODE ISLAND HEARS DILLON DISCUSS RUBBER AND FIBRES

The Spring Meeting of the Rhode Island Rubber Group was held on April 8, at the Crown Hotel in Providence, R. I. Principal speaker of the evening was Dr. J. C. Dillon, Director of the Textile Research Foundation, Princeton, N. J., who spoke on the subject, "When is a Fibre a Rubber and Vice Versa."

Dr. Dillon first summarized the work of the Foundation, outlining its objectives and its program. The speaker then pointed out that there really is no such thing as a natural rubber or a natural fibre. Nature provides these materials for purposes which are quite divergent from those to which man has put them.

A discussion of the characteristics of high polymers in general was given, and rubbers and fibres were considered simply as classes of high polymers. Some fibres, such as natural cellulose, possess very strong intermolecular binding forces which hold the rigid molecular chains together so that great strength but low extensibility exists in the axial direction.

On the other hand, fibres such as wool and nylon possess definite rubbery characteristics which are produced by weaker bonds between the chains, bulky side groups which hold the chains apart, and the natural waviness in the chains. While wool yields a stress-strain curve very similar to that of rubber, nevertheless its elasticity appears to be of the "energy type" while rubber possesses an "entropy elasticity." However, it was stated by Dr. Dillon, gaps exist in these data which may cause us to modify our conclusions in this regard.

In the concluding portion of the talk, the "Dirty Tricks Department" was discussed in connection with alterations which can be made in fibres to control their degree of rubberiness; for example, rigid cellulosic fibres can be swollen to permit introduction of crosslinks and bulky side groups and thus induce greater extensibility—increased rubberiness. Other possibilities of fibre modification were enumerated which employ the concept of rubberiness as an index of fibre usefulness.

Following Dr. Dillon's address, the Group was entertained by the harmonies of the "Smoothies," a barber-shop quartet. The Summer Meeting of the Group has been scheduled for June 24, at the Pawtucket Golf Club, Pawtucket, R. I. The Fall Meeting will be held on November 18, at the Crown Hotel in Providence.

Philadelphia To Hear Reynolds

The Philadelphia Rubber Group Meeting to be held on June 11, at Kugler's Restaurant, Philadelphia, Penna., will be addressed by Dr. W. B. Reynolds of the Research Department, Phillips Petroleum Co. Dr. Reynolds will speak on the subject, "Philprene Low Temperature Rubber." Two subsequent meetings will be held this year, on September 17 and December 3. The September 17 meeting will be the annual outing.

GELDARD ADDRESSES QUEBEC ON RUBBER CHEMICALS FIELD

The April 8 meeting of the Quebec Rubber and Plastics Group held at the Ritz-Carlton Hotel, Montreal, Quebec, Canada, was addressed by Walter J. Geldard, Sales Manager, Rubber Chemicals, Naugatuck Chemical Division, U. S. Rubber Co. Mr. Geldard spoke on the subject "Current and Future Prospects in the Chemical Rubber Field." Approximately fifty members and guests attended the meeting.

The speaker reviewed the development of organic rubber chemicals, especially accelerators and antioxidants, from 1915 to the present. The various major classes were developed and characterized by their current applications and uses. Mr. Geldard stated that with the introduction of synthetic rubber the emphasis on certain groups and particularly certain individuals was changed. Fortunately for the war effort the existing rubber chemicals were applicable to the vulcanization of new synthetics. No basically new chemicals were needed or introduced during the war, he stated.

The programs for research and development reached their maximum productivity between 1920 and 1935. Most of the recognized fields of possible profit in research have been extensively and thoroughly exploited, Mr. Geldard stated. This is evident by the great number of patents which have been issued by the U. S. Patent Office.

For the future, new organic groups must be investigated. New intermediates, heretofore not available, may be produced to offer practical starting points for new chemicals. Many known chemicals cannot be produced profitably, he said, because of the unavailability of raw materials or intermediates.

Mr. Geldard suggested the following as desirable organic rubber chemicals for future consideration: effective non-staining and non-discoloring antioxidants; safer acceleration for high temperature processing which still possesses high activity at curing temperatures; super flex-cracking inhibitors; retarders which are effective in processing and ineffective or activating at curing temperatures; and chemical plasticizers or peptizers to reduce the present high cost of preparing rubbers for processing.

Form Dismuke Tire & Rubber Co.

The Dismuke Tire & Rubber Co., Clarksdale, Miss., was recently formed for the manufacture of tubes and camelback. Incorporated under the laws of the State of Mississippi, the new company has a capital of $200,000, of which more than half has been paid in. A recently completed plant with 14,000 square feet of floor space has been outfitted with the latest machinery and equipment and will have a production capacity of 2000 tubes per day. Present production averages 600 tubes and about a ton of camelback a day. Company officers are: *President,* W. O. Dismuke, *Vice-President,* B. L. Field, *Secretary-Treasurer,* N. E. Rutledge. Plant superintendent is L. H. Ray.

Laurence Joins Philback Group

A. E. Laurence

Albert E. Laurence, associated with the Thiokol Corporation for the past six years both in the laboratory and as midwest sales and service engineer, has been appointed technical sales representative of the Rubber Chemicals Division of the Phillips Petroleum Co. He will handle sales and service of Philblack in New Jersey, southeastern New York, eastern Pennsylvania, Maryland, and Virginia, with headquarters in Trenton, N. J. After graduating with honors in chemical engineering from the Armour Institute of Technology in 1935, Mr. Laurence joined the Goodyear Tire & Rubber Co. in the tire compounding division. He remained with Goodyear until 1940, when he joined the Solo Works as chief chemist, remaining with that company until he went with the Thiokol organization. Mr. Laurence is a member of the Rubber Division, A.C.S., and was instrumental in the recent formation of the Trenton Section of the society.

Sunshine Exposure Station

The Sunshine Exposure Station has recently been established in St. Petersburg, Fla., with the purpose of supplying various industries with facilities for economically testing the ability of their products to withstand the effect of sunlight. Under the direction of Frank E. Rupert as general manager, the Station will furnish reports on samples on standard forms as recommended by ASTM. The facilities provided, however, are primarily exposure, as it is believed that test samples should be returned to the customer at stated intervals for personal inspection.

National Rubber Increases Shares

Stockholders of the National Rubber Machinery Co. at their recent annual meeting voted to increase the authorized number of common shares from the 154,000 currently outstanding to 200,000 shares. The company was also authorized to adopt a par value of $10.00 for its common stock. Previously the stock had no par value.

PALMER, RITCHIE AND STANGOR HEAD AKRON GROUP FOR 1948

Announcement of the results of a letter ballot for the election of officers was made at the Spring Meeting of the Akron Rubber Group, held on April 16 at the Mayflower Hotel in Akron. Officers elected for the 1948-49 season are: *Chairman,* Henry F. Palmer; *Vice-Chairman,* C. A. Ritchie (Goodrich); *Secretary,* E. L. Stangor (DuPont).

Two talks dealing with new paint techniques and with the application of color in industry were the features of the after dinner program. Speakers were Joseph C. Thompson, Jr., assistant general paint manager of the Pittsburgh Plate Glass Co., who talked on "Color Dynamics and Its Application to Industry," and Philip Wiegand of the same company, who spoke on "Industrial Finishes and Finishing."

Mr. Thompson made use of a number of interesting charts which illustrated the methods of preventing fatigue in workers and of achieving better productivity and worker morale through the proper use of color on walls, floors, ceilings and machine parts. Mr. Wiegand described new materials which have recently come into use, and discussed new techniques which are being used by the paint industry, including electrostatic deposition of paint.

Akron Outing on June 18

The annual summer outing of the Akron Rubber Group will be held on Friday, June 18, at the Lake Forest Country Club, Hudson, Ohio. David Anderson (Cabot) is the general chairman for the affair. The program calls for day long golfing, followed by dinner and a prize drawing. Mr. Anderson has announced the following appointments to committees to help with the affair: *Entertainment,* L. V. Cooper (Firestone); *Golf,* Dan Doherty (Herron Bros.), chairman, Harry Brubaker (Phillips), R. L. Reeves (Binney & Smith), and Paul Hartzfield (DuPont); *Prize Solicitation,* W. H. Ayscue (DuPont); *Food and Location,* John M. Walsh (Xylos), chairman, and Fred W. Gage (Columbia Chemical); *Tickets and Finances,* Roy L. Marston (Binney & Smith); *Publicity,* R. F. Wolf (Columbia Chemical).

Reorganize Sniffin-Arnold Co.

George W. Sniffin and Fred L. Arnold have announced the reorganization of the partnership of Sniffin, Arnold & Co., 76 Beaver St., New York 5, N. Y., to conduct a crude rubber brokerage business. For many years prior to World War II this partnership was in operation and functioned effectively. The firm was originally organized in June, 1930, and suspended operations in July, 1942. Mr. Sniffin joined the Rubber Development Corporation and spent five years in government service in Washington. During the early phase of the war Mr. Arnold was associated with the Rubber Reserve Corporation. For the past three years he has been manager of the crude rubber division of A. Schulman, Inc.

WASHINGTON HEARS GREATHOUSE ON DETERIORATION PREVENTION

The second meeting of the Washington Rubber Group was held on April 13, at the National Academy of Sciences Building, Washington, D. C. After a short business session, Dr. Glenn A. Greathouse of the National Research Council gave a talk on the subject "Prevention of Deterioration of Material." For his work on the prevention of deterioration of material during the past war, Dr. Greathouse has been chosen by the British Government to receive the King's Medal for Service in the Cause of Freedom.

In discussing some of the phases of this work, the speaker included rubber, plastics, textiles, electrical insulation, and coated fabrics. Dr. Greathouse stated that both natural and synthetic rubber may deteriorate with time when exposed to certain conditions such as light, moisture, chemicals, and occasionally microorganisms. More data is available on the aging of rubber products than on the resistance of rubber to biological attack. The speaker therefore limited his address to a review of the information on the effect of microorganisms on rubber degradation.

Dr. Greathouse stated that as a general rule pure rubber is oxidized by bacteria more rapidly than compounded or vulcanized rubber products. It was suggested that rubber could be protected with preservatives and that tetramethyl thiuram disulfide (Tuads) rendered rubber resistant to attack by *Macrosporium sarcinaeforme*. He outlined the work done in this direction by various scientists, among them A. E. Dimond, J. G. Horsfall, C. E. Zobell, C. W. Grant, J. D. Beckwith and others.

After a question and answer session there was shown, through the courtesy of the B. F. Goodrich Co., a newly-released All-American Farm Technicolor film entitled "Rubber Lends A Hand." This motion picture, which was filmed on famous farms, plantations and dairies in seventeen different states, showed the amazingly wide range of usefulness of rubber in easing the work of the modern farmer.

Form Charleston Rubber Co.

The Charleston Rubber Co. was recently organized at Charleston, S. C., for the manufacture of linemen's rubber gloves. Officers of the new company, all previously associated with the Surety Rubber Co., are William Prohaska, president; Russell Evans, vice-president in charge of sales, and Paul A. Belknap, secretary-treasurer. Mr. Belknap will also act as chief chemist. Additional executive personnel includes Jack Eynon as production manager and Willard Houselander as engineer. The new company, incorporated with a capitalization of $100,000, has acquired a group of three one-story buildings in Charleston, with a total floor space of 12,500 square feet. Production is expected to be started shortly. Present plans call for the development and production of industrial rubber gloves in the near future.

GENERAL MANAGER OF "RUBBER AGE" TO ATTEND CONFERENCE

Peter P. "Pete" Pinto, general manager and treasurer of RUBBER AGE, will attend the Rubber Technology Conference to be held in London, England, on June 23, 24 and 25, under the auspices of the Institution of the Rubber Industry. He is flying to London on Pan American Airways on June 17 and will sail from England on the *Queen Mary* on July 2. Mr. Pinto will make his headquarters at the Dorchester Hotel in London during his stay in England.

Mr. Pinto has been associated with the rubber industry for more than thirty-two years. Following his graduation from New York University in 1915 with a degree in civil engineering, he joined the staff of the *India Rubber World*, serving under Henry C. Pearson, founder and editor. He joined the Firestone Tire & Rubber Co. in Akron in April, 1916, in the planning and efficiency division, but returned to New York in August, 1917, to become a member of the staff of RUBBER AGE.

In December, 1917, Mr. Pinto was granted a leave of absence to undertake a special assignment with the National Bureau of Standards at Washington, D. C., and in February, 1918, entered the Aviation Service of the U. S. Army, assigned to the Radio Division. He saw active service in France, and was mustered out as a second lieutenant in February, 1919.

Peter P. Pinto

He rejoined RUBBER AGE immediately, and has been associated with this publication ever since except for a short period with the former Portage Rubber Co. in Barberton, Ohio.

RUBBER AGE extends a sincere invitation to its numerous friends and subscribers on the European Continent to take advantage of Mr. Pinto's visit to London to confer with him on problems relating to the over-all rubber industry and particularly to those concerning the United States.

Marshall Plan Taxes Goodyear

Large Marshall Plan demands for mechanical rubber goods have not been met by domestic plants of the Goodyear Tire & Rubber Co. and orders are being filled by its foreign plants, officials revealed on April 21, at the opening of a three-day sales engineering conference at the Park Central Hotel in New York City. Domestic business, for mechanical rubber goods for the first quarter of this year, is running ahead of 1947 sales, which reached an all-time peak, they said. Current backlogs on these lines are now ranging from forty-five days to six months. About eighty sales managers and field representatives attended the sessions, which included reviews of product designs and forecasts for production and sales volume.

Article on Synthetic Rubber

An interesting article under the title of "Eighty-Eight Years of Synthetic Rubber," by Ralph F. Wolf, appeared in the March, 1948, issue of *The Scientific Monthly*. The history of synthetic rubber, from its earliest beginnings to present day developments, is covered in the article. Mr. Wolf is associated with the Research Department of the Columbia Chemical Division, Pittsburgh Plate Glass Co., Barberton, Ohio.

Ribbed-Top Conveyor Belt

A new ribbed-top conveyor belt designed especially to prevent backslip in carrying sand and gravel, wet-mixed concrete, gold dredgings and other "soupy" materials up steep inclines, has been developed by the Goodyear Tire & Rubber Co. The new belt, first of its kind in the Goodyear line, features chevron-shaped ribs one-quarter inch higher than the belt surface. The ribs serve as barriers, trapping the water and preventing the backwash of materials down the belt on incline operations. The belt has a five-ply rubberized fabric body, and a quarter-inch top cover in addition to the ribs. It is being made in widths of 30 to 48 inches, and in lengths to customers' specifications.

Form Sacomo Manufacturing Co.

The Sacomo Manufacturing Co. was recently organized on the West Coast for the manufacture of rubber and allied products. The new company has purchased the building and equipment of the now defunct Plant Rubber and Asbestos Works at 537 Brannan St., San Francisco 7, Calif. Dan Coyne is president of the Sacomo firm and Vic Sagues, formerly superintendent of Plant Rubber, is secretary-treasurer.

NAMES IN THE NEWS

WARD FISHER, associated with the Goodrich organization in various capacities for the past 10 years, has joined the Armstrong Tire Co., West Haven, Conn., to work on tire development.

JOHN F. D. ROHRBACH, associated with Raybestos-Manhattan, Inc., in various executive positions since 1939, has been elected president of that company, succeeding SUMNER SIMPSON who is now chairman of the board.

EARL BUNTING, chairman of the board of directors of the National Association of Manufacturers and president of the O'Sullivan Rubber Corp., was recently elected managing director of the N.A.M.

EDWARD W. MCCARTHY, associated with the Vulcan Proofing Co. for the past few years, has been placed in charge of that company's development and control laboratory.

F. H. BANBURY, of the Farrel-Birmingham Co., inventor of the well-known Banbury Mixer, recently received the Modern Pioneer Scroll of Achievement from the National Association of Manufacturers. The award is an honor conferred on outstanding inventors and research Scientists in various fields of industry.

Howard H. Weber, associated with the U. S. Rubber Co. since 1934, has been named chief engineer of the wire and cable department. A. S. BASIL, with the company since 1926, has been named general sales manager of the same department.

WILLIAM A. ROBERTS, formerly manager of the mechanical goods division of the Inland Rubber Co., has joined the Phoenix Manufacturing Co., Joliet, Ill., as manager of the rubber department.

WALTER W. PEACOCK, Jr., formerly associated with the Stanley Chemical Co., has been appointed technical sales representative for the Chemicals Division of the Glenn L. Martin Co. He will cover New England and New York City.

HOWARD M. HUBBARD, who has a twenty-five year background of management and production experience, and who has been operating as a consulting engineer for the past three years, has been elected as president of the Hydraulic Press Mfg. Co., Mount Gilead, Ohio, filling a vacancy created by the resignation of H. A. TOULMIN, JR., last November.

DR. D. P. MORGAN, formerly in charge of chemical market research and development for W. R. Grace & Co., and previously director of the Chemicals Bureau of the War Production Board, has joined the Mathieson Chemical Corp. as administrator of research and development.

HOWARD SWIRES, formerly assistant plant superintendent of the Mexican affiliate of the General Tire & Rubber Co., has been appointed plant manager of the company's new Argentine affiliate with headquarters at Buenos Aires. JOE DELAPLANE, formerly with the facility engineering department of the company, was named to the Mexican position.

JOHN F. D. ROHRBACH, associated with Raybestos-Manhattan, Inc., since 1939, has been elected president of the corporation succeeding SUMNER SIMPSON who becomes Chairman of the Board and of the Finance Committee.

R. P. CARLTON has been elected executive vice-president in charge of manufacturing, engineering and research for the Minnesota Mining & Manufacturing Co.

BEN R. FROST, formerly associated with the Container Corporation of America, has been appointed general sales manager of the Pyramid Rubber Co., Ravenna, Ohio.

EDWARD E. COLLIGAN, formerly associated with the Plymouth Rubber Co., has been appointed vice-president in charge of sales of the Waterproofed Infant's Wear and Electrical Insulation Divisions of Chase & Sons, Inc., Randolph, Mass.

JOHN O'NEIL, son of WILLIAM O'NEIL, president of the General Tire & Rubber Co., has been elected treasurer of that organization, succeeding WINFRED E. FOUSE who will continue as a vice-president and a director of the company.

DR. HERBERT LEADERMAN, formerly associated with the Textile Foundation and the Firestone Tire & Rubber Co., has joined the National Bureau of Standards where he will do research on the fundamental mechanical properties of high polymers.

EDWARD J. MATTHEWS, associated with the U. S. Rubber Co. since 1937, has been appointed manager of the shoe products department, with full supervision over the production and sale of rubber heels and soles, and shoe cements.

S. C. STILLWAGON, chief engineer of the Hodgman Rubber Co., Framingham, Mass., for the past several years, and formerly editor of the *India Rubber World*, has left the Hodgman organization to enter the real estate and insurance business in Harwich Port, Mass.

DR. WALDO L. SEMON, director of pioneering research of the B. F. Goodrich Co., was recently elected a member of the Board of Governors of the National Farm Chemurgic Council.

GERALD KUCKRO, chief chemist of Cords, Ltd., Newark, N. J., for the past several years, has left that organization and is now affiliated with Molded Latex Products, Inc., Paterson, N. J., as assistant to the president.

WILLIAM A. KOETH, associated with the securities business in the Cleveland area for the past 15 years, has been elected president of the Aetna Rubber Co.

DR. GEORGE O. CURME, JR., a vice-president of both the Bakelite Corp. and the Carbide & Carbon Chemicals Corp., both important units of the Union Carbide & Carbon Corp., has been elected vice-president in charge of chemical research of the parent organization.

DR. HENRY F. PALMER, for many years associated with the Firestone organization and now conducting an independent consulting service with headquarters in Akron, was recently married to Miss Evelyn Winifred Anderson of Washington, D. C.

A. P. YONIS, associated with the Hood Rubber Co., Watertown, Mass., for some time, has been named manager of the company's glove division, succeeding W. W. CLAY who recently resigned to go into business for himself.

CLINTON M. WHITE has been elected secretary and managing director of the National Association of Waste Material Dealers, Inc., succeeding CHARLES M. HASKINS who has retired from active management of the association after thirty-five years of service. Mr. Haskins remains with the association as advisory vice-president.

L. L. SMITH, treasurer of the B. F. Goodrich Co., completed 40 years of service with the company on April 6.

HARRY L. SHOWALTER, associated with the drop forging industry for many years, has been appointed sales representative for the Erie Foundry Co. for the Eastern Pennsylvania, New Jersey, Maryland and Delaware territories.

Voit Acquires Huntington Rubber

The W. J. Voit Rubber Corp. of Los Angeles, Calif., recently celebrated its 25th year in business by taking over the facilities of the Huntington Rubber Co., as part of its expansion program. In announcing the transaction, Page Parker, vice-president of Voit, stated that the acquisition of additional heavy equipment will enable the company to expand its production of rubber-covered athletic balls and tire repair materials. With the acquisition of the Huntington Rubber Co., Voit will expand to include the manufacture of rubber floor tiling and garden hose. Main plant of the company is located at 1600 East 25th St., Los Angeles, Calif.; the new Huntington Rubber Division at 4010 Whiteside Rd., Los Angeles.

Stiff Handling Black Sales

John F. Stiff

Early in June, John F. Stiff of the Technical Service Division of Binney & Smith Co. will be transferred to the Sales Department and will be responsible for a new company office at 3329 Ridge Rd., Lansing, Ill. Mr. Stiff will cover most of Indiana, Wisconsin, Michigan and Illinois with the exception of metropolitan Chicago. Mr. Stiff received a B.S. in chemistry from the Massachusets Institute of Technology in June, 1939, and was a chemist with the Pittsburgh Plate Glass Co. for three years. During the war, he served as a first lieutenant in the Army Chemical Warfare Service, stationed at the Chemical Warfare Service Development Laboratory at M.I.T. doing research and development work on protective equipment. For the last two years, Mr. Stiff has been with Binney & Smith's Technical Service Division.

United Rubber Machinery Moves

United Rubber Machinery Exchange of Newark, N. J., are now located at their new address, 183-189 Oraton St., corner Elwood Ave., Newark 4, N. J., where a new office and warehouse building was recently completed. Other installations and equipment have been added in order to facilitate the handling of machinery. With the installation of new cranes and railroad sidings, the company is said to be in a better position to give more expedient service.

Form Hydrolock Manufacturing Co.

The Hydrolock Manufacturing Co., Inc., has been formed in Mansfield, Ohio, for the manufacture of high pressure steam connections for the rubber industry. The firm plans to start construction of a new plant in Mansfield within the next few months. The incorporators of the new company are Kenneth M. Snider, Marian A. Knapp and Homer G. Clark.

Polysar Adopted As Brand Name

The Polymer Corp., Sarnia, Ontario, has adopted a brand name, Polysar, to distinguish its various types of rubber. In a new code book recently issued to the rubber processors of Europe, Africa, and North and South America, the company lists twenty-three types of rubber, and in each instance the name Polysar is used to prefix a code designating a particular type. Because the name butyl has won popular acceptance, the company has retained it in the name Polysar Butyl which is now used to designate polymers of isobutylene and isoprene. For its other types of rubber, the Canadian company is now employing the new brand name followed by alphabetical and numerical symbols.

Pennsylvania Investments Rise

More than $10,525,000 will have been invested since the war in new plants and equipment in Pennsylvania by 38 rubber and leather goods companies, it was shown in an industrial survey announced in Harrisburg, Penna., recently by Governor James H. Duff and Secretary of Commerce Orus J. Matthews. This is part of an expansion of more than two billion dollars reported by 1,086 companies which had participated in an industrial survey conducted by the Department of Commerce and the Commonwealth of Pennsylvania. The survey contained actual figures on construction for 1946 and 1947, and estimates for 1948.

Nopco CFI Wax Lubricant

The Nopco Chemical Co., Harrison, N. J., has announced a new wax lubricant for processing synthetic stocks. Known as Nopco CFI, the product is a low melting synthetic wax. It is claimed to be effective in cutting the tack or stickiness which is often noted when synthetic rubber stocks which are heavily loaded with fillers are milled on a hot mill. Generally, it is said to be useful in any synthetic stock which tends to cause sticking, such as neoprene or butyl. It has no effect on the cure.

Dow Reduces Saran Price

A reduction in the price of Saran film 517 and type M was announced recently by the Dow Chemical Co., Midland, Mich. The reduction on the film amounts to approximately 25% and is effective immediately. The film, used for many types of food packaging, is manufactured by Dow in gauges from 50 to 200 in rolls up to 40 inches wide and in seamless flat tube widths from 6 inches through 32 inches.

Piccolyte Resin Prices Reduced

The Pennsylvania Industrial Chemical Corp. has released new prices lists for the terpene and pinene grades of resins sold under the trade name Piccolyte, with price reductions up to 5c per pound, and average percentage cuts approximating 20 per cent. The price cut is intended to widen the base market for the resins, the company stated.

Slingluff Heads Schulman Division

Eugene Slingluff

Eugene Slingluff, general sales manager of the Plastics Division of A. Schulman, Inc., of Akron, Ohio, has been promoted to the position of manager of a new department established by the company, namely, the New and Used Machinery Division. The new department, under Mr. Slingluff, will promote sales of rubber and plastics processing machinery. Mr. Slingluff will also continue his activities with the Plastics Division.

February Consumption Declines

Rubber consumption in February amounted to 86,085 long tons, a decline of 14.92% from January's consumption of 101,177 long tons, according to a report recently issued by the Rubber Manufacturers Association. The shorter work month contributed to the reduced consumption of all types of rubber. Total natural rubber use declined from 58,174 long tons in January, to 50,927 in February, while the consumption of all types of synthetic rubber declined from 43,003 long tons to 35,158. In addition, 22,017 long tons of reclaimed rubber were consumed during the month, a reduction of 14.94% from the 25,885 long tons consumed in the previous month.

Protox-166 Zinc Oxide

Protox-166, formerly known as XX-166, has been added to the regular line of quality zinc oxides featured by the New Jersey Zinc Co. Several years of research and development in the laboratory and pilot plant indicated that propionic acid treated zinc oxide had several properties particularly desired by rubber compounders. Wide introduction of the new type zinc oxide was prevented by World War II. Since 1946, however, Protox-166 has been subjected to large scale plant tests in a variety of compounds, and the satisfactory results led to its inclusion in the company's regular line.

PUBLICATIONS OF THE BRITISH RUBBER PRODUCERS' RESEARCH ASSOCIATION

Abstracts of some of the recent publications issued by the British Rubber Producers Research Association were published in our February, 1948, issue. These booklets, which cover the research work conducted by various members of the B.R.P.R.A. staff, can be secured by writing to the Association at 19 Fenchurch St., London, E.C.3, England. Abstracts of the some of the more recent publications follow:

Photolysis of Rubber, by L. Bateman (Publication No. 81): The action of light in promoting the degradation of rubber is a complex process. This paper describes experiments carried out under the simplest possible conditions, involving the most rigorous exclusion of oxygen. Irradiation with ultraviolet light rapidly causes the rubber to become insoluble, and promotes the evolution of small amounts of gas, mainly hydrogen. Isoprene is not evolved in appreciable quantities unless the rubber is simultaneously heated to a temperature exceeding 150°C. Reactions observed under these conditions are of no importance in normal aging, but their study has thrown valuable light on the fundamental reactivity of rubber.

Certain Fundamental Concepts Relating to Non-Polar Mechanisms in Olefinic Systems, by E. H. Farmer (Publication No. 82): The application of polar concepts to the interpretation and systematization of experimental observations in the field of organic chemistry has had such striking success and usefulness during the past 25 years that the concepts have become an integral part of organized chemical knowledge. Recent years, however, have seen the steady accumulation of experimental results which do not fit in the polar scheme and these may be rationally and consistently interpreted as resulting from the occurrence of apolar types of reaction in which the participants are short-lived neutral entities (molecules or atoms) displaying free-radical characteristics. On the apolar basis the author outlines a hypothetical correlation of a considerable array of experimental results with which he has been concerned — both as an immediate aid to making sense of what would otherwise seem to be unusually complicated and unintelligible, and with the hope that the views tentatively advanced will furnish suggestive starting points for future kinetic experimentation.

The Addition of Thio-Compounds to Olefins. Part I. Reactions of Thioglycollic Acid, Thiophenol and Isopentanethiol, by J. I. Cunneen (Publication No. 83): This paper describes an investigation of the reaction of rubber and simple olefins with thioglycollic acid, thiophenol, and *iso*pentanethiol. In the presences of peroxides, all these thio compounds react readily with *cyclo*hexene and l-methyl *cyclo*hexene, yielding liquid sulfides in practically quantitative yield. These sulfides have been identified by oxidation to the corresponding crystalline sulfones. At the asymmetrically substituted double bond it is shown that the orientation of addition proceeds contrary to Markownikoff's rule. A slight depression in reactivity was found on proceeding from the *cyclo*hexenes to dihydromyrcene and squalene and on attempting to extend these reactions to rubber a marked decrease in reactivity was encountered.

Equilibrium Properties of High Polymer Solutions and Gels, by Geoffrey Gee (Publication No. 84): This paper gives a simple account of recent work on the thermodynamic properties of polymer solutions and gels. It is pointed out that the current statistical theories can be used to investigate a variety of problems. The general method of approach is illustrated by discussing (a) the basis of oil resistance in rubbers, and (b) the choice of solvents and plasticizers.

The Addition of Thio-Compounds to Olefins. Part II. Reactions of Thiolacetic and Mono-, Di, and Tri-Chlorothiolacetic Acids, by J. I. Cunneen (Publication No. 85): This paper describes the reaction of rubber and simple olefins with thiolacetic acid and mono-, di-, and tri-chlorothiolacetic acids. In the presence of peroxides the above thiolacids react vigorously and exothermally with all the simple olefins yielding liquid thiolacetates in large yield. The *cyclo*hexyl and l-methyl-*cyclo*hexyl thiolacetates have been identified by hydrolysis and conversion of the liberated mercaptans to the corresponding phenyl sulfides and thioglycollic acids. In contrast to the mercaptans the thiolacids react readily with rubber giving rubber-like derivatives, showing considerable resistance to aliphatic hydrocarbons.

German Synthetic Plants Shut

The Information Center of Industry, Essen, Germany, has announced that production of synthetic rubber in Germany has been halted. The shut-down of synthetic plants was attributed to the fact that the manufacture of synthetic requires too much coal, and that the cost of synthetic will not stand competition in the world market. The yearly production of synthetic in the combined zones amounted to 6,000 tons, and in the Russian zone to 5,800 tons. Imports are to compensate for the loss of production.

More Students at Brown School

The Brown Instrument Co. has doubled the student capacity, space and equipment facilities of the Brown School of Instrumentation in Philadelphia, through the leasing of new and larger quarters consisting of a four story building. The school will extend its courses in processing control and will add classes for the teaching of specialized subjects. Free tuition is provided for customer students.

Develop Soft Rubber Plug Cap

The U. S. Rubber Co. has developed an extension cord set equipped with an unbreakable three-way plug and attachment cap made of soft rubber. The set will be produced in 6, 9 and 15 foot lengths with 1/32 and 1/64 rubber insulation over No. 18 wire. It is intended for general household use and will be merchandised through regular distribution channels to the electrical trade and consumer. Since the war, the company has been specializing in the development of soft rubber electrical wiring devices to replace hard rubber and plastic products. The company's household set equipped with a single soft rubber outlet and attachment plug cap has attained wide popularity since its introduction six months ago.

Bus Features Rubber Developments

Among the chief safety features of the new Highway Traveler, a deluxe 50-passenger compartment coach recently introduced by the Greyhound Corporation, are wire cord tires and newly-perfected crash-proof gasoline tanks, both furnished by the Firestone Tire & Rubber Co. The gasoline tank is an adaptation of many of the features of the self-sealing fuel cell used in combat planes during the late war, although weight of the tank has been reduced considerably and the self-sealing features have been developed into resiliency factors which are more to be desired in the fuel tank for bus and motor transport operations. The wired cord tires used are Firestone 11.00-19 white sidewalls.

Large Equipment Dynamometer

The Firestone Tire & Rubber Co., Akron, Ohio, has designed and built a new dynamometer which is said to more accurately measure horsepower requirements for heavy-duty earth moving and construction vehicles than any previous piece of testing equipment. The dynamometer, more than twice the size of any similar type of measurement device, has a draw-bar pull measurement capacity of 100,000 pounds. The large test unit is constructed on a 4 foot x 2 foot truck-tractor chassis. Component parts include a water tank to allow variable weights, diaphragm type draw-bar pull measurement devices at front and rear, and a fifth wheel with time and distance instrumentation.

Two Firms Enter Rayon Field

Two new producers, the American Development Co., a wholly-owned subsidiary of Beaunit Mills, Inc., and the United Rayon Corp., are entering the rayon yarn manufacturing field. The American Development Co. is constructing a 10,000,000 pound capacity viscose filament plant in Childersburg, Ala., while the United Rayon Corp. is planning to construct a $12,000,000 viscose filament and staple fiber plant. Both organizations are presently engaged in details of financing and registration with the Security Exchange Commission.

Files Suit Against Government

The Monsanto Chemical Co., St. Louis, Mo., filed a $5,000,000 damage suit against the United States Government on April 8, for loss and damages resulting from the destruction of its Texas City, Texas, plant on April 16, 1947, caused by the explosion of an ammonium nitrate laden ship. Stating that the Government, by reason of its large manufacture of ammonium nitrate for military explosive purposes, had knowledge of the potential hazards of the substance, the company charged the Government with the responsibility for the explosion. The suit was filed in the United States District Court. It included damages to the Texas City plant, expenses incurred and loss of profits resulting from the plant's destruction, and for the loss of service of the technically trained personnel killed in the disaster.

Pharis Roadgripper Tires

The Pharis Tire & Rubber Co., Newark, Ohio, has announced production of the Pharis "Roadgripper," newest in the line of company tires. Among the new features of this tire are an automatic vise-grip tread action, straight edge suction, snow plow road cleaning action and a deeper tread pattern. These qualities are said to give the tire an unusual amount of stability. The tire has a flatter contour, resulting in a wider distribution of the load over the tread surface. A new sidewall design, which incorporates "bracket braces" together with the wider tread pattern, combats side pressure that causes skidding.

U. S. Flotofoam Insulation

Plastic foam insulating material, that combines exceptionally low thermal conductivity with very light weight, is now being produced by the U. S. Rubber Co. for low temperature installations. Named "U. S. Flotofoam," the new material finds application in shipping containers for fresh and frozen foods, and commercial and home refrigeration units. The snow white plastic foam is available in shredded or block form. Among advantages claimed for the material are that it is non-corrosive, non-toxic and self-extinguishing. It will not support mold or bacteria growth and holds its insulating value over a wide range of mean temperatures.

Estimates Consumption For 1948

Consumption of rubber in the United States in 1948 is expected to be about 16 per cent below the figure for 1947, but 44 per cent higher than in the peak prewar year of 1940, John L. Collyer, president of the B. F. Goodrich Co., said recently at the annual meeting of the company's stockholders. The company's estimate for this year is 940,000 tons, he said, compared to 1,122,000 in 1947, the all-time record year. In 1940 the nation used 651,000 tons. Of the record 1947 total, Mr. Collyer explained, 55,000 tons, or 5 per cent, represented increase in manufacturers' inventories and was not reflected in sales.

Britton Heads Enjay Company

John A. Britton, Jr.

John A. Britton, Jr., a vice-president of the Enjay Company, Inc., since its organization in 1947, has been elected president of that company, succeeding H. W. Fisher, who continues as a director. Mr. Fisher was recently named general manager of East Coast Manufacturing of Esso Standard Oil Co., the parent concern. O. V. Tracy, assistant manager of the Esso Chemical Products Department, has been elected a director of Enjay. James G. Park continues as vice-president in charge of all operations, including rubbers and resins, of which Irving E. Lightbown continues as sales manager.

Prior to becoming a vice-president of Enjay on its formation last year, Mr. Britton, the new president, was associated with the Standard Oil Company (New Jersey) and affiliated companies for 27 years, largely in the development and sale of additives and synthetic rubbers. He is widely known throughout the rubber industry and is a member of the New York, Philadelphia and Los Angeles Rubber Groups. He is also a member of the Society of Automotive Engineers, the Oil Trades Association of New York, and the 25-Year Club of the Petroleum Industry.

At the same time it was announced that W. A. Fairclough, a member of the Enjay rubber sales group, has been transferred from the New York Metropolitan district to the Chicago office to concentrate on West Coast activities. Mr. Fairclough has been connected with Enjay and another of its predecessors, the Chemical Products Department of Stanco Distributors, Inc., as a technical representative on rubbers and resins since 1943.

Rome Cable Obtains New Interest

The Rome Cable Corp., Rome, N. Y., has obtained an interest in the Anderson-Carlson Mfg. Co. of Torrance, Calif. Anderson-Carlson will manufacture electrical metallic tubing and allied products after equipment is installed. These products will be sold through Rome Cable sales outlets.

Rubber Consumption For March

Total new rubber consumption in the United States during March was 92,359 long tons, as against 86,387 tons in February, according to a report issued by the Department of Commerce. Although March consumption was 6000 tons higher than in February, average daily consumption declined, since there were more working days in March. New rubber consumption for the first quarter of 1948 totaled 279,923 tons, a decline of 5.8% from the 297,014 tons consumed in the first quarter of 1947. Consumption of natural rubber in March was 54,230 tons. Included in this total of 2,135 tons of latex, the highest monthly figure since mid-1941. Synthetic rubber consumption totalled 38,129 tons, consisting of 29,713 tons of GR-S, 4,736 tons of butyl, 3,127 tons of neoprene, and 553 tons of N-types. Reclaim consumption was 24,719 tons.

Hose for Liquid-Propane Gas

The Hewitt Rubber Division of Hewitt-Robins, Inc., Buffalo, N. Y., has announced the development of a "super" hose which has made it possible for what is said to be the world's first liquid-propane gas tanker to operate in coastal service. Because the liquid-propane gas requires special handling, a flexible, super hose was an absolute necessity for the operation of the tanker. When loading or unloading is completed, the hose must be drained under pressure. The new Hewitt hose has a bursting pressure of 1,250 pounds. It has a maximum working pressure of 250 pounds per square inch, and is able to withstand a hydrostatic test of 500 pounds per square inch to meet the requirements of the U. S. Coast Guard.

New Type of Rubber Cement

R. H. Products, South Acton, Mass., are reported to have developed a new type of rubber cement unique in its ability to bond cured film from rubber latex. The properties of the new cement are said to be of particular interest to manufacturers of bathing caps, inflated valve balls, toys, and miscellaneous specialties. The cement has a base of natural rubber, but because of a new compounding technique eventually develops with latex film at room temperature an adhesive and cohesive bond as strong as the latex film itself. These features aid assembly operations and reduce leakage rejects. The cement is a solvent type adhesive.

Additional Barrett Report

The eighth report in its current Rubber Laboratory Releases has been issued by the Barrett Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. This latest report illustrates the performance of three grades of Cumar resin in channel black compounds, utilizing a blend of equal parts of natural rubber and GR-S as the elastomer. Copies of the report may be secured without cost on request to the company.

Farrel-Birmingham Centennial

The current year marks the 100th anniversary of Farrel-Birmingham Co., Inc., Ansonia, Conn. The company had its beginning in 1848 when Almon Farrel and his son, Franklin, built a foundry and machine shop in what is now Ansonia, formerly part of the town of Derby. The firm was known as Almon Farrell & Co., but was changed in 1849 to Farrel, Johnson & Co. and in 1850 to the Farrel Foundry. It became the Farrel Foundry & Machine Co. in 1857, shortly after the death of Almon Farrel. In 1927 a merger took place uniting the Farrel concern and the Birmingham Iron Foundry, the united companies being incorporated under the present name of the Farrel-Birmingham Co., Inc. Throughout its existence the company has been closely allied with rubber machinery and processing equipment. One unit of the company was turning out such equipment fully three years before the discovery of vulcanization by Charles Goodyear. Through all the years the Farrel family has maintained its interest in the business. Franklin Farrel, Jr., a grandson of Almon Farrel, is still a member of the board of directors and of the company's finance committee, while his son, Franklin Farrel, 3rd, is secretary and assistant treasurer of the firm. A number of other direct descendants of the founder are also associated with the company in various capacities.

To Expand Research Facilities

A $30,000,000 expansion of research facilities at the E. I. du Pont de Nemours Company's Experimental Station at Wilmington, Del., has been approved by the Executive and Finance Committees and submitted for ratification to the Board of Directors, the company announced on April 26. This is the biggest single laboratory project the company has ever taken. It will make the Wilmington Experimental Station, birthplace of nylon, neoprene and other products, one of the largest research establishments in the world.

Celebrate 75th Anniversary

The Keasbey and Mattison Co., which had its beginning with a small pharmaceutical laboratory back in 1873, is currently celebrating its 75th anniversary. The company is one of the outstanding asbestos manufacturers in the world and claims to be the original manufacturer of asbestos and magnesia products in the United States. Headquarters are maintained in Ambler, Penna., with additional plants in New Orleans and St. Louis.

Thermalube Mold Lubricant

Thermalube, a new mold lubricant derived from pulverized exfoliated vermiculite, is currently being marketed by Minnesota Micaeous Products, Inc., 1720 Madison St., N.E., Minneapolis 13, Minn. Described as a dry non-metallic mineral lubricant sold in powdered form, the product is said to be applicable for use in both wet and dry form wherever mold lubricants may be used.

Fisher Awarded Goodyear Medal

Dr. Harry L. Fisher

Dr. Harry L. Fisher, Research Director for U. S. Industrial Chemicals, Inc., Stamford, Conn., has been selected to receive the Charles Goodyear Medal for 1949 by the Division of Rubber Chemistry, A.C.S. The announcement was made at the recent meeting of the Division in Chicago, Ill. Presentation of the medal will be made at the Spring, 1949, Meeting of the Division in Boston, Mass., at which time Dr. Fisher will deliver the Charles Goodyear Lecture.

Dr. Fisher was born in Kingston, N. Y., in 1885, and attended Williams College, where he received his B.A. degree, and Columbia University, where he received his M.A., and Ph.D. He served as an instructor of organic chemistry in 1912 at Columbia University. In 1919 he joined Goodrich as a research chemist and remained with that organization until 1926, when he went to U. S. Rubber. In 1936, Dr. Fisher joined U. S. Industrial Chemicals, Inc., in the Development Department.

Dr. Fisher is the author of several books including the "Laboratory Manual of Organic Chemistry" and "Rubber and Its Uses." He is also the author of many technical papers on organic chemistry and the chemistry of rubber. He holds patents on several chemical processes, organic accelerators, nitrated rubber and methods of ionizing rubber, and the basis of the Vulcalock process.

Dr. Fisher is a member of many technical societies, and has actively participated in the affairs of the Rubber Division, of which he was chairman in 1927-28. He is a member of Phi Beta Kappa, Sigma Xi, and Phi Lambda Upsilon.

Liquidate Smithmore Chemicals

Smithmore Chemicals, Inc., Worcester, Mass., manufacturers of synthetic resins, has been liquidated. Former company officials have stated that no further business will be conducted by the organization.

Socfin Plans Latex Distribution

Messrs. Socfin Company, Ltd., of Malaya, one of the world's leading producers of natural rubber and palm oil, have concluded arrangements with Latex Distributors, Inc., of 80 Broad St., New York 4, N. Y., to sell their Hevea latex in the United States. Socfin has been converting its solid rubber output into "specialized types" and bringing large rubber acreages into latex production. The company is spending more than $1,000,000 in Malaya alone for latex facilities, and expects to be the first new producer to bring bulk centrifuged latices to America since the Japs over-ran the Far East. Creams, multipurified and concentrated types will also be produced. Latex Distributors, Inc., will provide bulk unloading, storage and handling facilities at Baltimore, Md., where a laboratory and office will also be located. Latex Distributors, Inc., was formed in 1946 by Messrs. M. Rothschild & Co. and Arthur Nolan.

Dow Marketing Methocel

Methocel, the cold water soluble cellulose ether marketed by the Dow Chemical Co., Midland, Mich., is reported to be finding successful application in the rubber industry as a thickening and creaming agent in rubber dispersions. The material is compatible with a wide range of synthetic latices and with natural latex, and can be easily added to these dispersions. Methocel solutions are said to be very effective mold release agents where mold temperatures are not excessively high.

Vinyl Group Seeks Standards

Producers of vinyl film and sheeting, meeting under the sponsorship of the Society of the Plastics Industry at the Hotel Commodore in New York City on April 8, have formed a separate division to formulate standards of quality in order to assure better and more uniform performance of products made from these materials. William T. Cruse, executive vice-president of the Society, is acting as interim chairman of the new group, which has set up subdivisions covering six main end-use classifications.

Braunsar Forms Own Company

Charles J. Braunsar, formerly associated with the Miller Products Co. of New York City, has formed his own company, the Plastic & Metal Products Co., 2721 North Darien St., Philadelphia 33, Penna., for the sale and distribution of rubber, plastic and metal products. The new company will do some of its own manufacturing as well as represent other manufacturers.

Absorbs Harkness & Cowing

Arnold, Hoffman & Co., Inc., chemical manufacturers of Providence, R. I., has acquired the business of the Harkness & Cowing Co., Cincinnati, Ohio, manufacturers of stearic acid, red oil and crude glycerine. Personnel of the Cowing concern remains unchanged.

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(No. 4 of a series)

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THE Birds and the Beasts were about to begin a great Conflict and the Bat hesitated to join either side.

To the Birds, he said, "I'm a Beast," and to the Beasts he said, "But I am a Bird."

Luckily, peace was made and no battle took place.

The Bat came to the Birds and wished to take part in their rejoicings but they turned against him and he had to fly away.

The Bat went to the Beasts but they tried to tear him to pieces.

"Ah," said the Bat, "I see now that he who is neither one thing nor the other has no friends."

★ ★ ★

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Hot Materials Conveyor Belt

The Hewitt Rubber Division of Hewitt-Robbins, Inc., Buffalo, N. Y., has announced the development of a hot materials conveyor belt that is cushioned with rubber and strengthened with glass. Simultaneously, Hewitt engineers also revealed a glass-fiber rubber hose that is said to resist any kind of acid and gives much longer service than standard cotton yarn reinforced hose. These new Hewitt developments mark the first time that glass reinforcement has been used in the manufacture of conveyor belting or hose, it was said. Fiberglas fabric is used in producing the belting, while Fiberglas yarn is the reinforcing material in the hose. Hewitt's claim to be the first in the rubber industry to use glass reinforcement goes back to 1939 when the company obtained small quantities of experimental Fiberglas yarns, which it tried out in rubber hose and belting.

Author's Correction

In a "Letter to the Editor" in our February, 1948, issue, Alan Speedy, director of Binney & Smith & Ashby, Ltd., of London, England, in commenting on the article "Phenolic Resins in Natural and Synthetic Rubber" by J. C. Searer, published in our November, 1947, issue, pointed out that the use of phenolics in rubber was not relatively new, since he had used phenolformaldehyde resinoid in oil and petrol (gasoline) resisting rubbers prior to 1918. Mr. Speedy also stated that airplane petrol hose under the trade name of "Solcenti" was used during World War I. We have since been advised that the proper trade name for the hose was actually "Solanti." We are glad to call this to the attention of our readers.

Fura-Tone 1350 Polymer

According to the Irvington Varnish and Insulator Co., 6 Argyle Terrace, Irvington 11, N. J., the oil-proofness and solvent resistance of synthetic rubbers are increased by the addition of Fura-Tone 1350, the company's new product. A polymer of a furane derivative, this soft, jell-like product may be readily compounded with synthetic rubber without affecting the curing cycle or impairing tensile strength. It can be sheeted on a mill with fillers. The company claims the use of Fura-Tone 1350 will greatly improve the life of oil-resistant gaskets, printing rollers and gasoline hose.

Adopts Electronic Vulcanization

After several years of experimentation, electronic vulcanization has been adopted as standard production procedure for certain types of extruded products by the B. F. Goodrich Co., according to a recent announcement by the company. Products aggregating industry-wide sales volume of $45,000,000 annually, including tubing, strip and channel stock and rubber thread, are now being made by the new method. In some products the actual curing time is said to be reduced from one and a half hours to two minutes.

Denies Buna Charge

Karl Krauch, chairman of the board of I. G. Farbenindustrie, A.G., one of the chief defendants in the trial of top executives of the German chemical trust being held in Nuremberg, Germany, on January 12 testified that the charges that he had personally stimulated the development of buna rubber for the use of the German Army were a gross misunderstanding of his motives. Buna, he said, was recognized by Farben as far superior for shoe soles than leather, and his insistence on expanding production had been for the purpose of providing German consumers with a superior type of footwear.

Offers New Credit Service

Edward V. Tarnell, associated with the National Credit Office for the past 16 years, has organized the Tarnell Co., Inc., 40 East 34th St., New York 16, N. Y. The new company is offering a specialized credit service to manufacturers and suppliers of raw materials to the plastics manufacturing field, but plans to extend its service to cover the rubber manufacturing and other fieds in the near future. Mr. Tarnell started and headed the paint division of the National Credit Office and from 1944 to 1947 was in charge of that concern's rubber division.

Planning Sci-En-Tech Building

Plans are under way for the creation of a Sci-En-Tech building in downtown Chicago, Ill. The Chicago Technical Societies Council, of which the Chicago Rubber Group is an affiliate, plans to have a building housing the offices of the Council and the member societies and including suitable meeting and banquet facilities. A study of space requirements and costs is currently being made.

Division Issues Membership List

A separate booklet containing its complete membership list as of January 1, 1948, has been issued by the Division of Rubber Chemistry of the American Chemical Society. Copies have been supplied to all members. The list was authorized by the Executive Committee of the Division and is not to be used in any way, directly or indirectly, for advertising or circularizing purposes or as a basis for solicitation.

Materials Handling Book

Publication of "Some Basic Techniques in Materials Handling," a report of the proceedings at technical sessions of the Conference on Materials Handling, held in Cleveland, Ohio, last January, has been announced. The book, which includes 19 of the papers presented, is believed to be the first report of its nature ever published. It may be obtained for $1.00 per copy from Clapp & Poliak, 350 Fifth Ave., New York 1, N. Y.

Geon Latex 31X

The B. F. Goodrich Chemical Co., Cleveland, Ohio, has announced the development of a water-borne plastic resin that will form a glove-like film on a hand dipped into it and which can be peeled off like a rubber glove. Unlike other substances designed for similar end uses, this substance, called Geon Latex 31X, is said to require no hot air in converting it into finished products. It is a latex of vinyl chloride resins. The liquid can be used to make a water paint with a water-impervious film that will dry at room temperature; for packaging foods, as a protective covering for fruits and vegetables; as an adhesive, and in other ways, the company stated. Geon Latex 31X is flexible, odorless, grease-resistant, will not support a flame, and adheres readily to paper, wood, Fiberglas and textiles.

"Ultrasol" Vinyl Coating

Production of Ultrasol, a new vinyl resin coating, combining flame resisting qualities with exceptional abrasion and weathering characteristics, has been announced by the Merrimac Division of the Monsanto Chemical Co., Everett, Mass. Ultrasol-coated fabrics are similar in appearance to the more common nitrocellulose-treated products. Applied to paper or fabric, it gives either a smooth, colorful finish or a decorative leather-like effect, the company stated. Ultrasol will not support flame, it is said, and when applied to untreated fabrics, retards burning considerably. The company's tests show high resistance to abrasion, hard use and moisture.

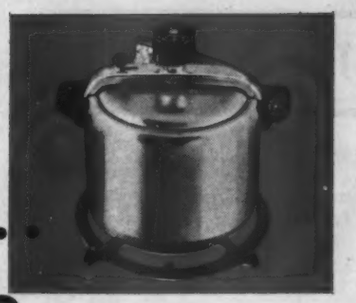
Goodrich Adopts Sponge Name

The B. F. Goodrich Co. has adopted the term "BFG Foam Cushioning" as its trade name for its latex foam sponge. In arriving at the name, Goodrich considered the fact that the sponge that lives in the sea has interconnecting cells. Sponge rubber, so-called because it was supposed to resemble a sponge, does not. But the soft, cushiony rubber used for mattresses and chairs does have interconnecting cells, and therefore it is more like a sponge than "sponge rubber" itself. "BFG Foam Cushioning" has hundreds of thousands of tiny air cells which give the rubber its buoyancy.

Vinyon N Synthetic Fibre

The Union Carbide and Carbon Corp. has begun production of a new synthetic textile fibre in a large experimental plant in Charleston, W. Va. Called Vinyon N, the fibre is a chemical combination of vinyl chloride and acrylonitrile, and is said to stand boiling water, and to be chemical, rot and weather resistant. Vinyon is now made chiefly in heavy denier sizes for industrial use, but is expected to ultimately enter the hosiery and fine fabric market. The company stated that it does not expect to enter the textile field, but plans to sell raw material to textile mills.

When "the heat's on"... pressure, too, this PERBUNAN gasket can take it!



When deciding on a material for the gasket of their famous pressure cooker, the Ekco Products Company chose a *Perbunan* composition because it:

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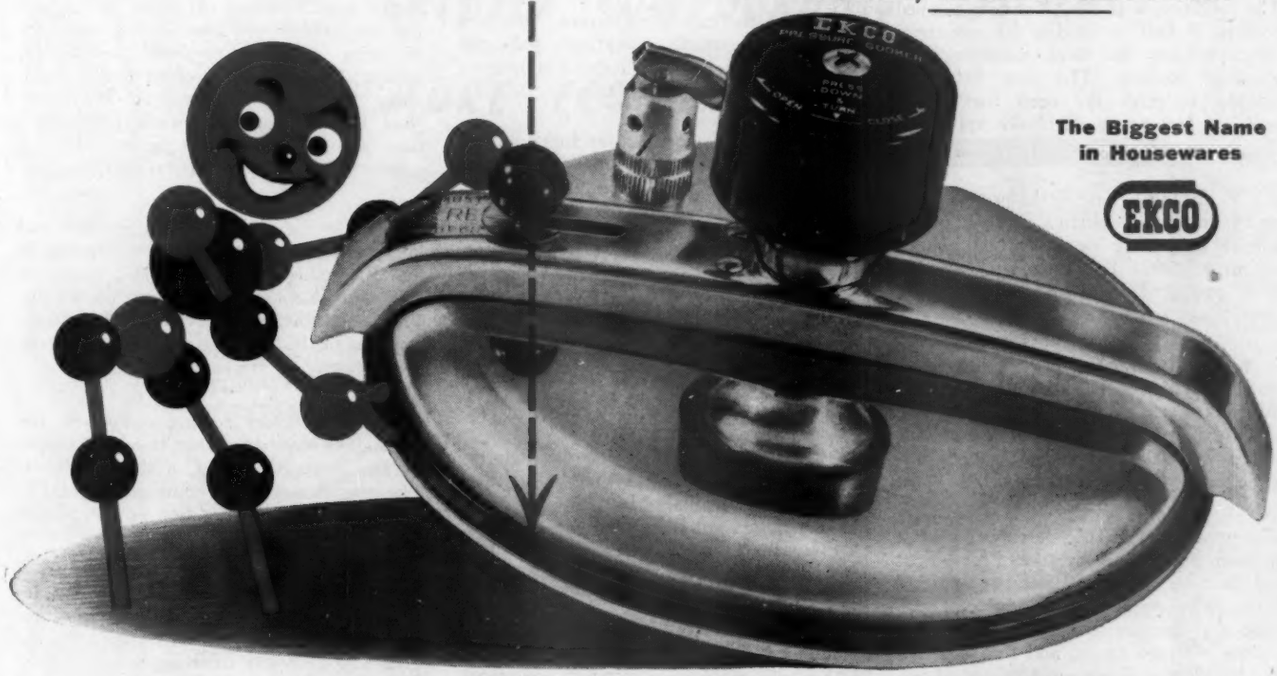
3. *Has no taste or odor, even when boiled in water for long periods of time; not harmed by washing in hot, soapy water.*
4. *Has good physical properties such as: (a) high tear resistance, (b) good tensile strength, (c) good elongation.*
5. *Materially reduced the manufacturing cost of the* EKCO *Pressure Cooker.*



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NEWS IN BRIEF

Three folders describing the Straitflo Strainer, the Measurflo Control and the Electroflo Valve, new products of the Hays Manufacturing Co., Erie, Penna., have been made available by that company. These products find application as standard fittings on manufactured equipment, as maintenance items for factory supply lines in processing operations, and for trouble-free service in water, steam and gas lines.

A double-lip pipe wiper for use in wiping oil well drill pipes is now being produced by U. S. Rubber. The wiper is made of natural rubber in 14 and 17 inch sizes to fit any pipe.

The San Francisco offices of the Witco Chemical Co. have been moved to newly-furnished offices in the Humboldt Bank Building, 785 Market St.

The addition of the Newly-developed Ray-Man V-Belt to its line of industrial rubber products has been announced by Manhattan Rubber. The new belt was developed to meet the need for a belt possessing features particularly applicable to tough rugged drives.

U. S. Rubber has developed a new slippery finish for electrical wire to make the wire pull more easily through sharp bends in conduit. The super-slippery surface is produced by a new wax coating on the insulation.

A technical bulletin on "Aenite as a Non-Staining Non-Discoloring Antioxidant" has been made available by the DuPont Rubber Chemicals Division, Wilmington 98, Delaware. Copies are available on request to the company.

The production of silicone rubber sponge has been announced by the Connecticut Hard Rubber Co. Advantages claimed for the new sponge include low cost, unchanging properties and flexibility over a wide temperature range, and the fact that it can be secured in extruded shapes, sheets or molded items.

The outfield walls at Ebbets Field, home of the famed Brooklyn Dodgers, have been padded with sponge rubber to help protect zealous outfielders in the event of contact when pursuing long fly balls. The protective padding, prepared by U. S. Rubber, is made of chemical sponge rubber, one inch thick, covered with heavy mildew-proof duck.

A study on "Acceleration and Retardation with Philblack 0 in Natural Rubber Treads" has been made available by the Rubber Chemicals Division, Phillips Petroleum Co., Akron. Copies may be secured direct from the company.

U. S. Rubber has announced a new sheet material, consisting of nylon fabric combined with rubber, for pressure regulator diaphragms. Replacing the conventional sheepskin and cotton duck, the new material is said to have greater flexibility, lighter weight, higher bursting strength and improved sensitivity.

Goodrich has issued a new accident prevention booklet to its employees wherein the consequences of carelessness are effectively illustrated by grimly humorous cartoons and verses.

Fifty-five miles of nylon cord are used in the construction of its 56-inch airplane tire, according to Goodrich. These tires will be used on the Boeing 377 Stratocruiser.

Yellow electrical cable which can be seen plainly in the darkness of a coal mine has been developed by U. S. Rubber in a move to increase mine safety. The new cable will be made in various sizes for use on cutters, loaders, drills, locomotives, and other mining equipment.

Brown Instrument has developed an improved skip-numeral print wheel which when used with strip chart electronic recorders permits symmetrical and well-defined multiple measurement records. It enables the use the slower chart speeds.

A general bulletin, listing the various products which are now supplied by its Chemical Division, has been made available by the Koppers Co., Pittsburgh 19, Penna. Ask for Bulletin C-7-103.

"A Primer on Rubber for the Printer" is the title of a new 14-page illustrated catalog made available by Goodyear. The booklet points out the advantage of rubber printing materials and describes the company's products in this field.

Resistoflex Corp., Belleville, N. J., has announced that Resistoflex Hose, made with a tube stock of compar, is now available in larger sizes for conducting hard-to-handle solvents and gases. Most of the constructions are produced with or without a static discharge wire.

Goodyear is producing 200 nylon mattresses spread and impregnated with a special rubber compound consisting of a blend of various rubbers for the 1948 survival test operation currently being conducted by the U. S. Army in Alaska.

Midland Rubber Co., Cedar Rapids, Iowa, has appointed Merwin F. Read as their Detroit representative for automotive sponge rubber products. He will make his headquarters at 512 Donovan Building, Detroit.

25-Year Tire Comparison

Whether its a tire or attire, great changes have taken place in the past twenty-five years, as indicated by the accompanying illustration. The comely miss on the left is steadying a Dayton Rubber low pressure tire of 1923, while the one on the right is holding the new 1948 Super Low Pressure Autocrat tire which Dayton Rubber will soon introduce to the motoring trade. From all indications, tires and attire have evolved pretty much along the same pattern. In 1923 they went for straight lines, while today both tires and attire seem to be striving for comfort and ease of operation.

The use of aromatics in rubber and latex products is the subject covered in the November-December, 1947, issue of *The Givaudanian*, house organ of the Industrial Aromatics Division, Givaudan-Delawanna, Inc. Copies are available from the company on request.

A new puncture sealing compound for automobile inner tubes has been introduced by the Even-Air Corp., Caldwell, N. J. The consistency of the compound is said to be unaffected by either age or absence of light.

A new technical bulletin describing its sec-Butylbenzene, now available in commercial quantities, has been issued by the Chemical Division of Koppers Co., Inc., Pittsburgh, Penna. It contains technical data including properties and reactions of the compound.

A new lightweight laboratory apron made of Koroseal has been added to the Goodrich line. It is made of .006 gauge translucent Koroseal film, with cloth tape neck band and tie strings. It measures 29 by 35 inches.

Advantages and new developments in the use of rubber with shaft rollers and idler sheave fillers are cited in a new brochure prepared by the Molded Goods Division, Goodyear Tire & Rubber Co., St. Marys, Ohio. The brochure includes photographs of installations, engineering tables, and formulas.

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Additional Low Temperature Data

The role played by the University of Minnesota, of Minneapolis, Minn., in the development of the so-called low temperature synthetic rubber was outlined in a special statement recently issued by Dr. I. M. Kolthoff, chief of the university's division of analytical chemistry. Dr. Kolthoff explained that one of the basic problems faced by the scientists was that in lowering the temperature for the production of the synthetic the time of preparation was increased to the point where such production was impractical. The time element was finally eliminated by substituting an organic peroxide for the inorganic salts usually employed as a catalyst and by the application of the so-called "Redox" system, the addition to the standard recipe of an oxidizing and reducing agent. According to Dr. Kolthoff, credit for valuable contributions to the further development and understanding of the low temperature production method should go to one of his assistants, A. I. Medalia, of Boston, Mass., who has been associated with the Minnesota project since 1943.

Heat and Mass Flow Analyzer

The existence of an "electrical wizard" which will take the guess-work out of many industrial and scientific problems was recently revealed by Columbia University in New York City. The device is a specialized type of calculating machine known as a "Heat and Mass Flow Analyzer Laboratory." Its principle is based on the "electric analogy" method, which means that flow of heat is measured in the same way as electric current. The device is utilized in connection with several projects undertaken by the university, including a program of "fundamental engineering science research" in the field of heat flow. Sponsors of this program include the Firestone Tire & Rubber Co., B. F. Goodrich Co., and the U. S. Rubber Co.

"Carbowax" in Full Production

"Carbowax" compounds 4000 and 6000 are now being shipped in carload quantities from the Institute, W. Va., plant of the Carbide and Carbon Chemicals Co. Carbowax compounds are said to be particularly valuable to the rubber industry as mold lubricants for foam rubber. These water-soluble wax-like solids have been used for some time as mold release agents for mechanical rubber goods. Carbowax 4000 and 6000 are among the first products to reach full-scale commercial production from new facilities installed at Institute.

Forms Phoenix Rubber Co.

Albert Westphal, formerly secretary-treasurer and general manager and principal owner of the Reliable Rubber & Engineering Works, Inc., Burlington, Wisconsin, has organized the Phoenix Rubber Co. in Phoenix, Arizona. The new concern will distribute mechanical rubber goods and will also offer a consulting engineering service.

J. M. HOOPES

who recently joined the Synvar Corp., Wilmington, Delaware, as a sales representative, as announced in a recent issue.

Firestone Receives Safety Award

The Firestone Tire & Rubber Co. has received its third Award of Honor for distinguished Service to Safety from the National Safety Council. The award is given only to industrial organizations which have achieved outstanding safety records. Firestone's frequency rate for accidents in 1947 in 23 plants in 13 states and in Canada was 2.9 per million manhours worked, representing a 67.5% decrease since 1945 when the company received its first safety award. Latest National Safety Council figures available showed the national frequency average for accidents in the rubber industry as 11.28 per million manhours and the United States all-industry average as 14.16.

Communications on Latex

The Rubber Foundation, Delft, Holland, has issued Communications No. 59 and 60, in one booklet, covering two recent reports on latex. Communication No. 59 is entitled "Notes sur le Latex et le Cauotchouc de Ficus Elastica" (Notes on the Latex and Rubber of Ficus Elastica), by G. J. van der Bie, while the title of Communcation No. 60 is "Comparaison de Differents Types de Caoutchouc Obtenus a Partir d'un Meme Latex Frais" (Comparison of Different Types of Rubber Obtained from the Same Fresh Latex), by G. J. van der Bie. Both reports are in French and originally appeared in *Revue Generale du Caoutchouc.*

Planning Two Rubber Movies

Two separate Hollywood studios are planning motion pictures with rubber backgrounds. RKO has announced that it will film "Operation Malaya," a story written by Manchester Boddy dealing with the significance of rubber in the war effort, while United California Productions has acquired the screen rights to Fereira de Castro's "Jungle," a novel dealing with rubber culture in the Amazon.

Non-Inflammable Sponge Rubber

A new non-inflammable, low cost sponge rubber with important application possibilities has been developed by the Commonwealth Engineering Co., Dayton, Ohio. Called "Spon," the new material can be delivered through a hose where it sponges at the nozzle, cast in sheets and in open molds, or continuously produced at high speed in sheet form. It can be applied and vulcanized directly to upholstery materials and the backs of rugs and carpets. It is also adaptable to construction use, being made in a simple, on-the-job apparatus which delivers the material for insulation, sound-proofing or cushioning. Substantially odorless, "Spon" is said to be very tough, highly resilient and soft to the touch, and to give a deep cushioning effect even in thin sections. It can be produced in a wide variety of colors and thicknesses, in a hard or soft-sponge. Plans are being completed by Commonwealth Engineering for licensing the new development.

Conduits Made to Specification

The Appliance and Merchandise Department of the General Electric Co., Bridgeport, Conn., has inaugurated a new service to supply electrical conduit assemblies made up to the specifications of individual equipment manufacturers. The service is designed to simplify the manufacturing problems of any company which determines, either during the engineering or production stage, that its product has electrical circuits requiring the protection of conduit. Manufacturers of such items as oil burners, water heaters, major appliances, textile machinery, machine tools, trailers and pumps, fall within the scope of the service.

Snyder Opens Canadian Plant

M. L. Snyder & Son, Philadelphia, Penna., manufacturers of rubber goods, fire equipment and oiled clothing, have opened a branch plant at 2777 Dundas Street, West, Toronto, Canada. The new plant will specialize in the production of waterproof clothing, utilizing neoprene, rubber latex, plastics, etc. First shipments are expected to be made at the end of May. The plant will be under the management of W. Charles Smith, with "Ted" Robbins as superintendent. The company operates three plants within the United States.

Low Temperature Pyrometer

Development of an instrument which makes possible accurate and close control of low temperature processing was recently announced by the Brown Division of the Minneapolis-Honeywell Regulator Co., Philadelphia, Penna. The new instrument is a low temperature radiation pyrometer which has been tested in rubber and plastic mills and in continuous curing ovens and paint pigment kilns, company officials stated. The tests are said to have shown that low temperature radiation control reduces rejects, speeds output, assures uniform quality and reduces power loss.

'Way back then, fifty years ago, bread and meat sat open on the counters. It was about then that Standard Oil Company first started its studies and experiments in light fraction petroleum refining . . . out of which came Esso Petroleum Solvents.

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Welding Polyvinyl Chlorides

The joining of plasticized polyvinyl chloride parts by welding as practised in Germany is the subject of a report now on sale by the Office of Technical Services, Department of Commerce. One of the secrets of German success in welding polyvinyl chloride, the report states, is the use of as hot a blast of air as possible to obtain a quick local melting of the surface without deep penetration, and to apply firm pressure with a roller. The methods used by four German firms are described in this report. The report also includes several diagrams and photos and a list of adhesives used in cases where welding is not feasible. Mimeographed copies of the report, PB-79583, the *Welding of Polyvinyl Chloride, Summary of German Practice,* sell for 50 cents. Orders should be addressed to the Office of Technical Services, Department of Commerce, Washington, D. C., and should be accompanied by a check or money order payable to the Treasurer of the United States.

Tank Car Lots of Califlux

The Golden Bear Oil Co., Oildale, California, has announced that Califlux R-100, its swelling agent and sulfur reactive plasticizer for general purpose rubbers, is now available for immediate shipment in tank car quantities. Califlux R-100, according to the company, is chemically identical with Naftolen R-100. The Golden Bear material has a slight activating effect on cure and is especially recommended by the company for natural rubber compounds. It has a mixed aniline point below 40° C., a specific gravity of 1.01 to 1.04, and a viscosity of 20,000 to 200,000 cp at 25° C. and 40,000 to 150,000 at 90° C. Califlux R-100 is produced from heavy naphthenic crude oil and consists predominately of high boiling unsaturated hydrocarbons.

Resume Production of Filatex

Filatex, the latex thread manufactured before the war by the Filatex Corporation, then a subsidiary of the Sylvania Industrial Corp., at Trenton, N. J., is again being produced. It is now being made by the Sylvania Division of the American Viscose Corp. at Fredericksburg, Virginia. Sales and service are being handled by the Filatex Corp., 350 Fifth Ave., New York City, now a wholly-owned subsidiary of the American Viscose Corp. The latter organization is also covering the thread at its Roanoke, Virginia, plant.

Sealing and Packing Material

Felt, in combination with Hycar latex and Hycar sheet stock, is being used by the American Felt Co. of Glenville, Conn., to produce mechanical sealing, packing and gasketing materials for many industrial applications. In these properties the natural properties of both felt and Hycar rubber are said to be mutually enhanced through combination. Cut into strips and washers, these materials are marketed under the trade names Vistex and Oil Foil.

FINANCIAL NEWS

Anaconda Wire & Cable Co.

For 1947: Net profit of $8,480,514, which is equal to $10.05 a common share and which compares with $3,094,161, after including $300,000 provisions for contingencies, or $3.66 a common share, in 1946. The consolidated balance sheet reveals that as of December 31, 1947, current assets totalled $31,400,246, including $5,412,472 in cash, $6,050,000 in Government securities, and $12,743,684 in inventories. Current liabilities as of December 31, 1947, stood at $12,065,322. As of December 31, 1946, current assets of the company were $26,187,566, and the current liabilities were $7,981,425. During 1947 the company spent a total of $2,789,812 for land, buildings, machinery and equipment.

U. S. Rubber Company

First Quarter: Net income of $4,601,164, which is equal to $1.87 a common share on consolidated net sales of $130,536,932. At the annual meeting in Atlantic City, N. J., on April 20, stockholders were informed that sales for the first quarter of 1948 were within seven per cent of the same period last year. Heretofore the company has reported semi-annually only.

Pantasote Company

For 1947: Net loss of $243,171, after giving effect to $300,000 tax carry-back credit, which compares with a net profit of $501,852, or $1.31 each on 385,138 common shares, in 1946. Net sales for 1947 amounted to $4,389,391, moderately above the 1946 record of $4,316,529. Totals include figures for the wholly-owned subsidiaries of the company.

Dayton Rubber Company

Year Ended Oct. 31, 1947: Net income of $1,815,625, which is equal to $3.80 a common share, and which compares with $2,101,524, or $4.23 a share, in the preceding year. Net sales in 1947 amounted to $34,163,450, against $32,624,568 in 1946.

Hewitt-Robins, Inc.

First Quarter: Net loss of $108,092, which compares with a net profit of $373,569, or $1.34 a common share, last year. The loss was attributed to a ten-week strike at the company plants in Buffalo, N. Y.

Goodrich has published a new catalog section on its multi-cord belting which it recommends for the severest drives. Construction is pictured and described, advantages cited and data outlined.

Landis & Co., Philadelphia, Penna., are offering Hallcraft rubber non-skid mats made of synthetic rubber.

Journal Covers New Developments

A number of new and unique applications for rubber are discussed in the March, 1948, issue of *Rubber Developments,* the quarterly journal issued by the British Rubber Development Board, Market Buildings, Mark Lane, London, E.C. 3, England. Among these are a cistern float, a wave propeller, clothes pins, hose for unloading wheat, conductor rail de-icing equipment, and a new type of "Cushyfoot" mounting. In addition there are articles on the latex foam market in the United States, rubber suspension systems for vehicles, farm tractor tires, latex processes and potentialities, rubber in architecture and building, etc. *Rubber Developments* is distributed without charge and members of the rubber industry will be added to the mailing list on request to the British Rubber Development Board. Copies of the three issues published to date can also be secured by writing to the Rubber Development Bureau, 1631 K St., N. W., Washington 6, D. C.

Harwick Building Plastic Plant

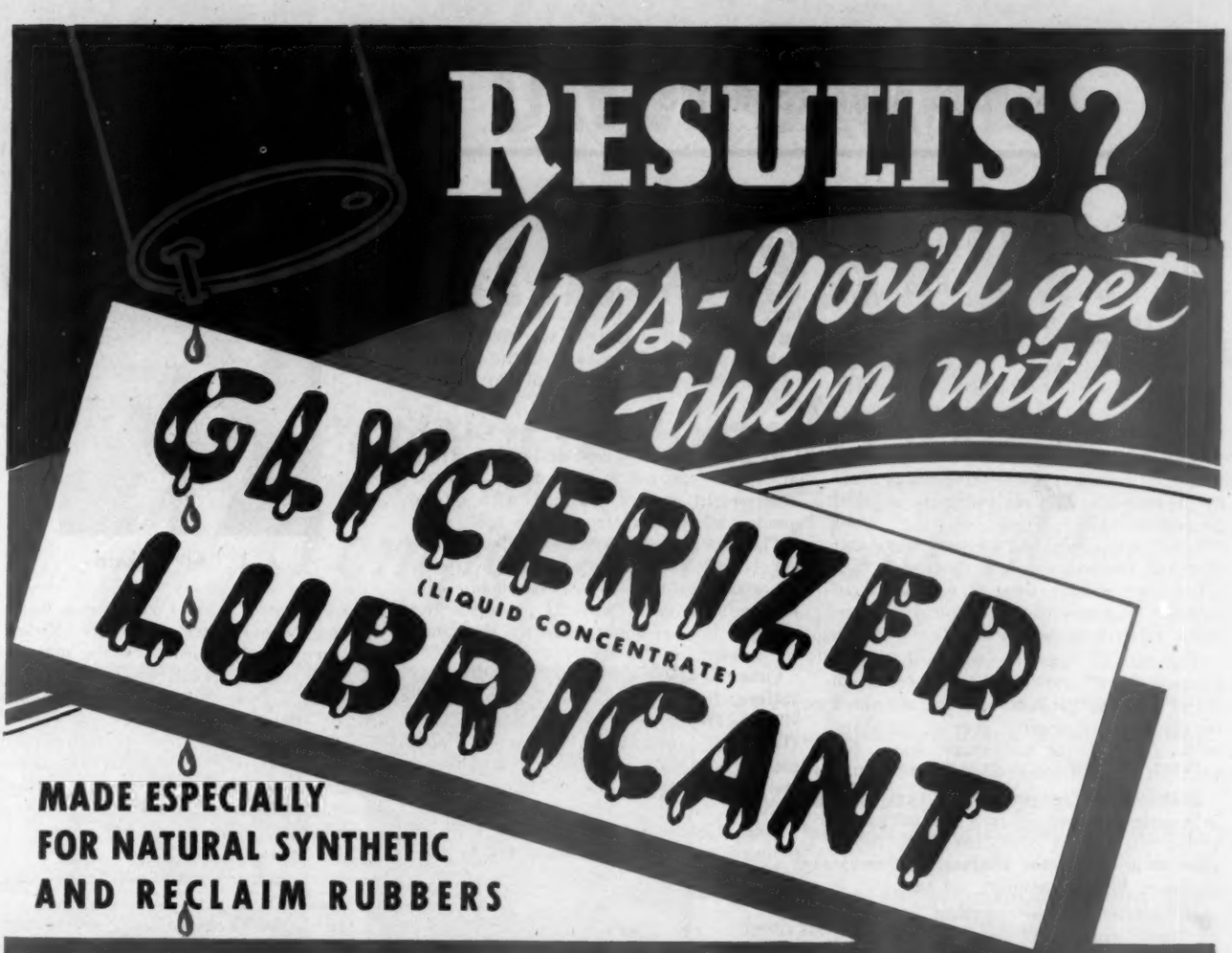
Ground has been broken for the construction of a chemical processing and plastics manufacturing plant in Akron, Ohio, for the Harwick Standard Chemical Co. C. J. Harwick, president of the company, said that the new plant, to be built at an estimated cost of $300,000, will be the first of several units planned for the 5-acre tract which his company recently purchased in Akron. The projected building will house a research center as well as facilities for phenolic resin applications in its 50,000 square feet of floor space. A consolidation of the company's warehousing facilities will also be a purpose in the new building plans. General offices of the company will continue to be centered in the Akron Savings and Loan Building. The new plant is expected to begin operation about October 1.

Sords Appointed Representative

Otto Sords, for many years connected with leading manufacturers of rubber working machinery and rubber products, including Firestone and Goodrich, has been appointed Akron District Representative for the Welding Methods Corporation, Dayton, Ohio. The company specializes in the production of heavy flame-cut gears and the reconditioning of Banburys and other rubber working machinery, including hydraulic presses, electronic controls, and automatic feeding and ventilating equipment and systems. Mr. Sords is a registered professional engineer.

Velvomat Auto Floor Covering

The U. S. Rubber Co. has developed a new type of floor covering for automobiles called Velvomat, that can be formed in one piece, if necessary, and used without binding. In its manufacture, the pile is built up on rubber, fabric or burlap, and can be varied in thickness, weight and pattern. The product is nonslip, and can be swept, vacuum cleaned or washed. It may also be used for bus, airplane and railroad floor covering as well as in office, plant or home.



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- GLYCERIZED LUBRICANT is highly concentrated. Only a 3 to 20% water dilution is required for practically all operations. One gallon makes 5 to 33 gallons of ready-to-use solution. A LITTLE GOES A LONG WAY! Composition is such that it is non-toxic and practically odorless.
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LOS ANGELES NEWS

The May meeting of the Los Angeles Rubber Group, sponsored by the U. S. Rubber Company, was held on May 4, at the Hotel Mayfair in Los Angeles.

The Technical Group regular meeting preceded the evening dinner meeting. Speaker Lou F. Gongwer, Chief Chemist and Manager of the Development Department of the J. M. Huber Corporation, Borger, Texas, gave a very interesting and enlightening discussion on "Clays for Rubber."

The introduction to his subject was made by defining clay and reviewing its physical properties. The origin of the word "kaolin" was given, and its occurrence and chemical composition was compared with other types of clay, most of which are not suitable as pigments for natural or synthetic rubbers, according to Mr. Gongwer.

The uses of "kaolin" and the difference between "hard" and "soft" rubber clays and their physical properties were compared on the basis of specific gravity, moisture, color, particle size and shape, water setting, pH, and all absorption characteristics.

Some of the properties of "hard" clay in a series of loadings in a natural rubber recipe were given, also "hard" vs. "soft" clay at a 40 volume loading for tensile, abrasion, heat generation, set, etc.

In conclusion, the physical properties of "hard" and "soft" clays in GR-S, G-I, and GR-M vs. EPC black and various other non-black pigments were described.

At the dinner meeting, John Miller, Plant Manager of the U. S. Rubber Company, introduced James F. Bone, Manager of the Industrial Department of the Los Angeles Chamber of Commerce, who spoke on "The Post War Industrial Development of Los Angeles County."

Mr. Bone pointed out that in the 1945-47 post-war period, a total of $364,000,000 was invested in new plants and expansions in Los Angeles County, which is $61,000,000 more than the $303,000,000 invested by the government and private industry in the 1942-44 war period. Today, he added, the industrial economy of the County is characterized by nine predominant industries, including the rubber industry, these industries normally employing 71% of all industrial workers in the County. The rubber industry in the County, he said, now ranks second only to Akron.

The Golf Tournament of the Los Angeles Rubber Group held at Baldwin Hills on April 9 proved a tremendous success. Thirty-eight golfers attended, with scores running all the way from 72 to 138.

The fine golf displayed by Wilbur Johnson (Du Pont Pigment Division) proved too good for the rest of the field. Mr. Johnson's 72 gross with 23 putts for the 18 holes left no doubt as to the outstanding winner for the day.

Other prizes were won by the following golfers: Bob Lees (American Anode), Bill Haney (Kirkhill Rubber), Earl Hensal (Goodrich), Bob Roby (Accurate Products), Jim Wilson (Accurate Products), and Ed Wilson (Golden State Rubber Mills).

Golf Chairman Al Federico has announced the next tournament will be held at the Wilshire Country Club on Friday, June 4, 1948.

Paul A. Karres and Joseph Kerley have taken over the interest of Green's Rubber and Machine Works, 19115 So. Hamilton St., Gardena, and will continue to manufacture a line of molded goods at that plant under the company name of Rubber Teck.

The plant and facilities of the Huntington Rubber Co. at 4010 Whiteside Street have been leased by the W. J. Voit Rubber Corp. The plant will be operated under the name of the Huntington Division of W. J. Voit Rubber Corp., with V. E. Holihan as general manager. Rubber floor tile, hose and camelback will be produced.

Some of the participants in the Los Angeles Rubber Group golf tournament.

Pickard Representing "Rubber Age"

A. L. "Al" Pickard, of the Braun Corporation, 2260 East 15th St., Los Angeles 21, Calif., manufacturers and distributors of chemicals and laboratory supplies, has

A. L. "Al" Pickard

been appointed West Coast News Correspondent for RUBBER AGE. Mr. Pickard has been closely allied with the activities of the Los Angeles Rubber Group since its inception and served as chairman in 1944. He is currently chairman of the Current Events Committee. We urge all of our readers to contact Mr. Pickard at the Braun Corporation on matters of general news interest for our Los Angeles News Section.

The B. F. Goodrich Co. celebrated the 20th anniversary of the opening of its local plant on May 3. The entire personnel was invited to the cafeteria to participate in a birthday party, complete with cake, candles, ice cream, etc.

Herb Griley, formerly with the Kay Trucking Co., has resigned from that concern and has announced the formation of a company of his own under the name of the Griley Transport Co.

V. S. "Andy" Anderson (Pacific Moulded Products), chairman of the Birmingham Veteran's Project of the Los Angeles Rubber Group, has announced that a stimulating device for aiding blood circulation and massaging muscles of the boys in the paralysis ward at Birmingham Hospital is about completed and will be delivered shortly. Others participating in this project include Earl Hutchinson (Firestone), Ralph Brown (Firestone), and Jack Knudsen (Kirkhill Rubber).

A. L. Adams, formerly manager of export aeronautical sales in England and Europe for the Goodyear Tire & Rubber Co., has been appionted sales engineer for the aviation products division on the west coast. Charles A. Oostdyk, Jr., associated with the Akron plant for the past year, has been named tank lining field engineer for the west coast district of the company's mechanical goods division.

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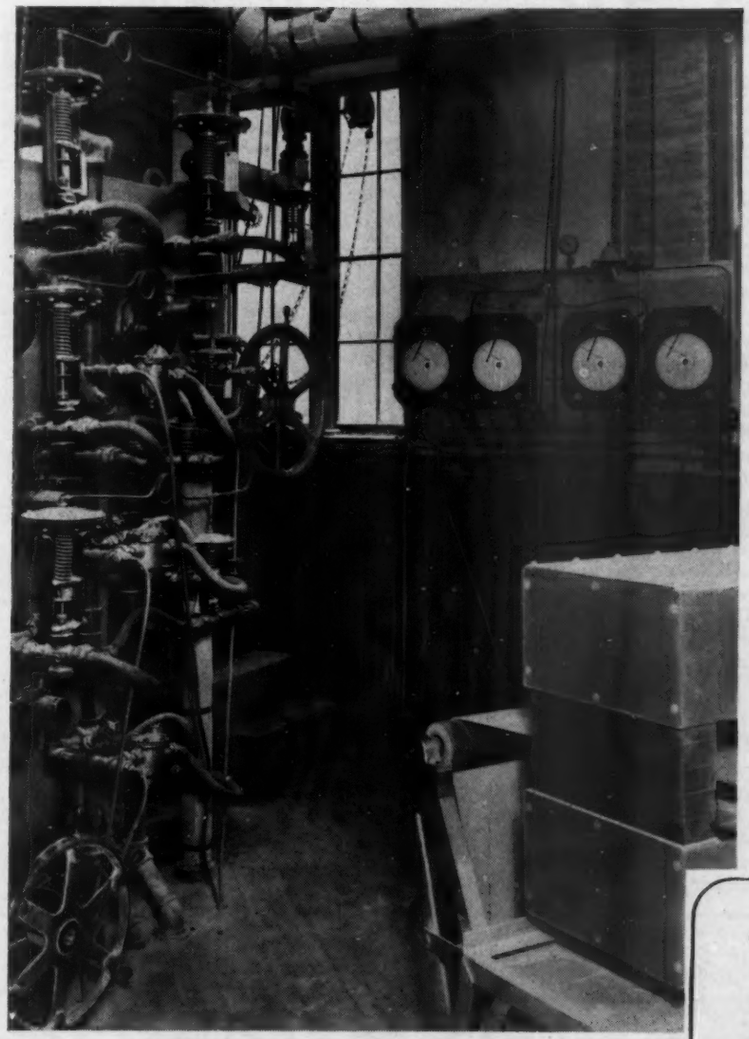

Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.

IF you haven't got uniform temperature in your calender roll, you can't get uniform sheets—whether you're calendering rubber, plastics, or rubber-impregnated fabrics. But a panel of Taylor Fulscope Controllers like this (left) will *assure you of uniform roll temperature* by automatically controlling both steam and cooling water.

Too high a temperature can make the sheets run over-thin. Too cool and they're likely to require re-processing. But automatic Fulscope Control keeps the temperatures—and the sheets—consistently uniform. Production costs are cut to rock bottom because one instrument controls both heating and cooling valves automatically.

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CANADIAN NEWS

A series of new industries has been established in Southern Ontario to make use of the by-products of the Crown-owned synthetic rubber plant at Sarnia, Ont., a government official recently said.

This official said he had not heard any suggestion here that the plant should be closed down. He was commenting on a statement made in London recently by W. F. E. Richards, chairman of the British Rubber Growers' Association, and on the action of the United States Congress which recently passed legislation to keep the U. S. government in the synthetic rubber business for two more years.

The Polymer plant at Sarnia now is producing about 115,000,000 pounds of rubber a year. For the last three months the United States Office of Rubber Reserve has been taking the Canadian plants' exportable surplus of general service synthetic rubber. This agreement expired several weeks ago and any further negotiations have had to await congressional action on the United States situation.

The official said the Sarnia plant is operating at full capacity. While its rubber output was an important feature, possibly more important was the production of by-products. These had led to the establishment of the new industries.

In London, Mr. Richards had said continued manufacture of synthetic rubber by the United States and Canada "is aggravating the unbalanced economy of the world."

Culminating 18 months of Canadian research, Polymer Corporation has succeeded in producing GR-S-lignin masterbatches on a pilot plant scale and is now preparing quantities for commercial evaluation, J. R. Nicholson, executive vice-president of the Sarnia company, has announced. The research making possible this development in the use of lignin as a reinforcing agent was a joint effort of the research staffs of Howard Smith Paper Mills, Limited, Cornwall, Ontario, and Polymer Corporation.

In laboratory tests, the new materbatch shows promising possibilities. The tests seem to indicate that the lignin is capable of reinforcing GR-S to an extent comparable with that of the best grades of carbon black. Thus it is possible that, with the masterbatch, high-strength GR-S compounds may be produced in light colors.

The new development has great commercial significance in view of the potential availability of lignin and the increasing scarcity of high-quality carbon black.

Members of U.R.W.A. Local 232 recently instructed their bargaining committee to open negotiations with the Goodyear organization at its New Toronto, Ontario, plant for a 15-cent-an-hour increase retroactive to January 19, or, failing that, to call for a strike vote. According to a union official, the company has offered a 10-cent wage increase, not retroactive, providing the union agrees that there will be no revisions and no negotiations on "fringe" issues for one year.

Another union official stated that a contract had been signed between Goodyear and Local 189 of the Bowmanville plant calling for a 9½-cents increase to be incorporated in piece work rates where piece work is involved. He said the contract called for no wage discussions within six months, and then only for a change in the cost of living, and no "fringe" issues. It is said to provide for payment for Good Friday with special pay for Christmas which this year falls on a Saturday.

Wm. H. Funston, president of the Firestone Tire & Rubber Company of Canada, interviewed at Hamilton, Ont., recently declared that the rubber industry would continue to face large demands for its products during 1948.

"Production will be maintained at rates exceeding those of pre-war years, but business has entered a buyer's market and retailers must learn to sell again, learn to serve again, if postwar volumes are to be maintained."

"The achievements of the rubber industry in 1947 can be credited largely to advanced manufacturing techniques brought about by wartime research and development, expanded capacity and continuous production," he said.

Natural rubber stocks in Canada at the end of February had fallen slightly to 5,704 tons, compared with 5,739 the previous month, but were more than twice the February, 1947, figure of 2,876 long tons, the Dominion Bureau of Statistics has reported. Reclaim stocks decreased from 3,114 long tons last year to 2,162 and synthetic from 4,551 last year to 4,062.

Domestic production of synthetic rubber fell from 4,024 long tons in February, 1947, to 3,388, while reclaim increased from 330 to 388. Domestic consumption of natural rubber increased from 2,224 to 3,474 but synthetic declined from 2,823 a year ago to 1,886 and reclaim from 1,463 to 1,216.

Alan R. Clark, associated with the sale of chemicals to the rubber, paint and chemical industries in Toronto and surrounding territory for over ten years, has been appointed sales manager of rubber chemicals for Naugatuck Chemicals, Division of Dominion Rubber Co., Ltd., Elmira, Ontario.

Bata Rubber Footwear for year round wear, a new division of the Bata Shoe Co. of Canada, Ltd., has announced the appointment of Jim Humphrey as Ontario representative, with headquarters at Toronto. The expansion of rubber production at the Batawa, Ontario, plant has resulted in the organization of this new sales division which will feature a full range of rubber footwear for all seasons of the year.

Alan R. Clark
new sales manager of rubber chemicals for Naugatuck Chemicals Division of Dominion Rubber.

Rossini Speaks at Calco

Dr. Frederick D. Rossini, chief of the Section on Thermo-Chemistry and Hydrocarbons of the National Bureau of Standards, spoke recently on the subject, "Fractionation Analysis and Purification of Hydrocarbons," at a meeting of the research, process development and engineering personnel of the Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J. Dr. Rossini discussed in detail the four methods used for the isolation and purification of hydrocarbons, namely, distillation, extraction, adsorption and crystallization. He used pictures and diagrams to describe the various pieces of equipment used in this development work.

Patent Problems Are Discussed

Patent problems of modern industry were discussed at a meeting of the Association of Research Directors held in New York City on March 18. The Association is composed of men in charge of research laboratories in the Northeast. The program was arranged by C. A. Stokes, director of research and development of Godfrey L. Cabot, Inc. The chief speaker was T. C. Browne, patent attorney for the Dewey and Almy Chemical Co., who described techniques in the preparation and filing of patent applications. A panel discussion was also held.

Tires For Replacement Market

The General Tire & Rubber Co., Akron, Ohio, has announced that its major passenger car tire lines, the low-pressure Silent Grips and the low-pressure Squeegees, are now available to the replacement market in all popular sizes. Distribution already is on a nation-wide basis through General dealers. The General Squeegee and Silent Grips are not available to automobile manufacturers as original equipment.

MEMORANDUM

To Chief Engineer
Factory Manager
Production Manager

see this press for top efficiency and low cost production.

asm

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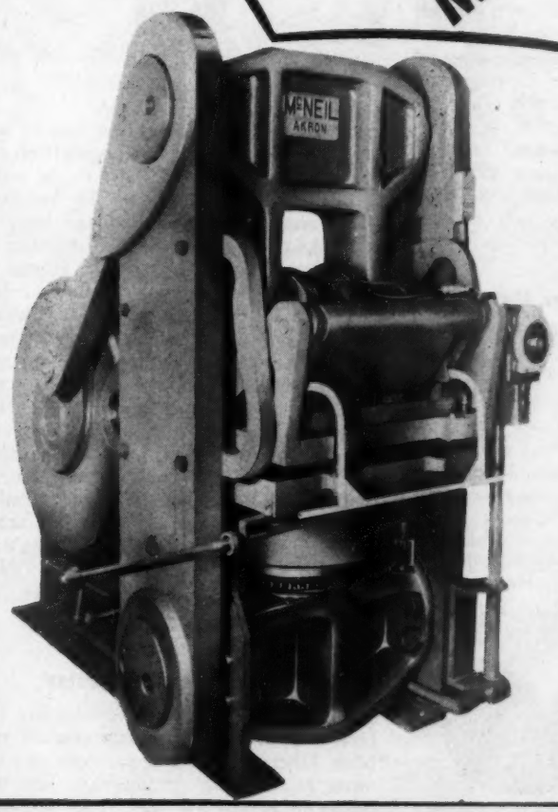
MECHANICAL GOODS PRESS MODEL 800-32-6



- MOTOR OPERATED — NO HYDRAULIC.
- 800,000 POUNDS TOTAL PRESSURE.
- 32x32 DRILLED STEEL STEAM PLATENS.
- 780 POUNDS PER SQUARE INCH PLATEN PRESSURE.
- SIMPLE SPEEDY ADJUSTMENT OF LOWER PLATEN.
- ADJUSTMENTS FOR MOLD LOADINGS ZERO TO 400 TONS.
- RANGE OF MOLD THICKNESSES 2" MINIMUM TO 6" MAXIMUM.

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MANUFACTURING AGENTS, GREAT BRITAIN—Francis Shaw & Co. Ltd., Manchester, England
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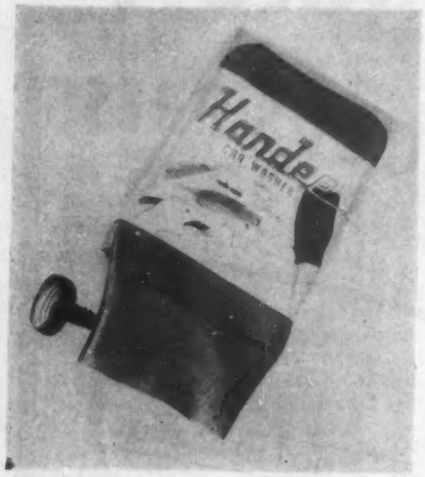
RUBBER WORKING MACHINERY • INDIVIDUAL CURING EQUIPMENT FOR TIRES, TUBES and MECHANICAL GOODS

NEW RUBBER GOODS

Improved Handee Car Washer

The Handee Car Washer, an improved pre-war product, was recently re-introduced by the Tri-Products Co., Holly, Mich. The unit is essentially a natural latex foam sponge designed so that a constant flow of water is introduced, in a



downward flow only, through thousands of tiny sprinklers. Water is introduced and forced through the washing sponge by a flexible rubber hose that is permanently attached to the sponge at one end and is equipped with a standard garden hose coupler. A special rubberized and waterproof mitt is permanently bonded to the foam rubber washing sponge, serving to keep the hands dry and warm, as well as preventing cuts and bruises common to ordinary car washing procedure. The complete unit is colorfully packaged.

Royal Master Low Pressure Tire

The U. S. Rubber Co. has announced a new extra-quality low pressure tire said to give up to 60% more safe mileage than ordinary tires. The new tire, designated the U. S. Royal Master, achieves its greater mileage through use of a 25% deeper tread of specially compounded and long wearing "tempered" rubber, company officials stated. It embodies the principle of low-pressure construction introduced by the company two years ago. The price of the new tires will be about twice that of present top-line casings, it was said.

Sunruco Battery Filler

The Sun Rubber Co., Barberton, Ohio, has developed the Sunruco Battery Filler which features an extra-long nozzle to provide easy access to hard-to-reach batteries. This new all-rubber filler has been designed to stand up under the deteriorating action of acids and petroleum products, the manufacturer stated. Also, it will retain its shape, due to an interior reinforcing band which offers greater resilience.

Fairprene Covers and Sheeting

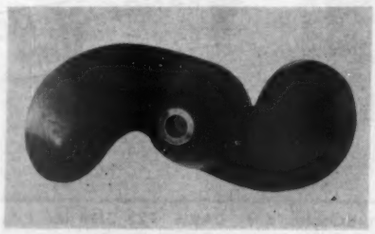
The Fabrics Division of E. I. du Pont de Nemours & Co., Inc., Fairfield, Conn., has developed a sheeting utilizing a nylon base which is coated on both sides with neoprene. Sold under the "Fairprene" trade mark, the sheeting was designed for use in hospitals and mental institutions where sheets and mattresses covers need be of unusual strength. The sheeting is said to be resistant to oil, to boiling water, steam and to chemical sterilization. It resists cracking, peeling and sticking and has good abrasion resistance. The sheeting is available in standard size rolls of 50 yards, or half rolls of 25 yards. The width is 36 inches.

Nylon-Reinforced V-Belt

A nylon-reinforced V-belt, which is said to have twice the strength and four times the average life of conventional V-belts, has been developed by the U. S. Rubber Co. Marketed under the name of U. S. Royal Super Service V-Belt, the belt contains a series of nylon cords covered with a special synthetic rubber compound capable of withstanding the deteriorating effects of heat and oil. The belt is recommended for power transmission on equipment subject to rough usage, such as grain harvesting and processing combines, and railroad, mining, oil well and paper processing machinery. The belt will be made in fractional and multiple sizes.

Rubber Propellers for Motors

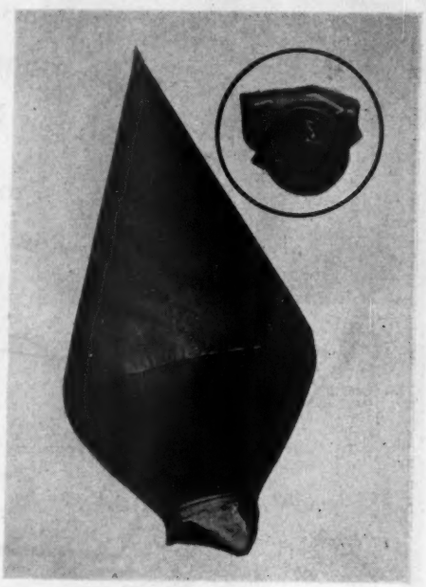
A rubber propeller for outboard motors has been developed by the Molded Goods Division of the Goodyear Tire & Rubber Co. Encasing a metal core of cast aluminum or bronze, the rubber propeller is said to be stiff enough to cut the water, and yet sufficiently resilient to slide over weeds without fouling, and to bounce over driftwood and other obstacles without shearing the drive shaft pin. Practicality of the propeller follows recent rubber-to-



metal applications by the company, using die castings or light metals in conjunction with adhered rubber, company officials stated. Other examples cited include flexible impellers for water pumps, rubber seat poppet valves, agitator shock absorption splines for washing machines, and rubber-covered driving rollers for clothes driers.

New Type Rubber Buoy

A new type of rubber buoy, which is finding various practical applications, was recently invented in France by Paul Vion. Made of rubberized fabric, the buoy is self-inflatable without chemical means. Cone-shaped, it is fitted with a metal rim at its base weighing 2 pounds. When thrown from an airplane, for example, the



metal rim serves to keep the bottom end down so that the buoy inflates itself on the way down. The second it strikes the water the air is sealed within the buoy and it is ready for use. Diameter of the buoy at its base is 8 inches, while the diameter at its widest point is 24 inches. It can be made visible in the dark by paint and thus used as a beacon buoy, or can be utilized in its regular form as a shooting target. It can be provided with a trailing cable and used for locating submarines, or it can be used for emergency purposes as a life belt. The French Navy is reported to be holding extensive tests on various sizes and shapes of the buoy. Manufacturing rights to the F47 Vion Buoy, as it is called, are offered in the United States or Canada by the Intercontinental Inventions Management Corp., 60 East 42nd St., New York 17, N. Y.

Flexible Duct Connector

Bauer & Black, Chicago, Ill., has perfected a new flexible duct connector utilizing Fiberglas tapes, a war-born development of company engineers. The duct connector is charactedized by its resistance to heat, light and deterioration, and its flexibiliity. The adhesive used is vulcanizable and is said to double its strength when subjected to heat, forming a permanent, tailored connection that is air-tight. Bauer & Black Industrial Adhesive Tapes No. 281 and 263 are used in the sealing. Both tapes utilize Fiberglas in their construction. No. 190 Fiberglas cloth, neoprene-coated on both sides, is used to complete the union.

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BANBURY PRESSES AND EXTRUDERS . . .

1—No. 9 Banbury and Reduction Unit

1—3" Royal Tuber with 15 H. P. Motor, Starter and Controls

1—4½" Royal Tuber with 20 H. P. Motor, Starter and Controls

1—3" Royal Tuber with 10 H. P. Motor, Starter

2—Mill Lines, Vertical reduction unit, bed rails, shafting and bearings, 200 H. P. Westinghouse Induction Motor, 440 Volt — 3 Phase — 60 Cycle
4—18" x 48" Mixing Mills Heavy Duty

1—Mill Line, Vertical reduction unit, bed rails, shafting and bearings — 200 H. P. General Electric Induction Motor — 440 Volt — 3 Phase — 60 Cycle
4—18" x 48" Mixing Mills Heavy Duty

1—Mill Line, Vertical Reduction unit, bed rails, shafting and bearings — 150 H. P. Westinghouse induction motor — 440 Volt — 3 Phase — 60 Cycle
2—16" x 36" Wash Mills
1—21" x 24" x 30" Refiner set up for fine grinding rubber with magnetic separator, screen and conveyor.

1—Mill Line for 3 mills — 2 mills only included with vertical reduction unit, bed rails, shafting and bearings — 200 H. P. induction motor — 440 Volt — 3 Phase — 60 Cycle.
2—18" x 48" Mixing Mills Heavy Duty

1—Mill Line for 2 mills — (Mills not included) vertical reduction unit, bed rails, shafting and bearings ONLY.

1—Farrel Reducer (150 H. P.) 6.44 to 1.

1—Mill Line for 4 mills — (Mills not included) vertical reduction unit, bed rails, shafting and bearings — 150 H. P. Motor — 440 Volt — 3 Phase and controls.

1—22" x 30" Cracker — Heavy Duty

1—Cross Conveyor — with small Palmer Bee Reducer.

1—15" x 24" Cracker Mill

1—17" x 28" Cracker Mill

1—1½" Ball Jewel Cutter — 20 H. P. Motor. Self Contained.

1—20/50 H. P. Reduction Unit — 5.1.

1—22" x 22" x 60" Mill Heavy Duty complete with base — 150 H. P. — Herringbone 6.1 reduction unit.

1—30" Robinson Attrition Mill

1—100 H. P. Motor G E — 2200 Volt — 600 R. P. M.

3—42" x 42" Four platen Hydraulic Presses — 14" Ram

2—42" x 42" Two platen Hydraulic Presses — 12" Ram

12—36" x 36" Two platen Hydraulic Presses — 12" Ram

5—36" x 36" Two platen Hydraulic Presses — 14" Ram

8—24" x 24" Two Platen Hydraulic Presses — 12" Ram

4—22" x 22" Two Platen Hydraulic Presses — 12" Ram

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OBITUARIES

Leslie B. Gordon

Leslie B. Gordon, director of engineering for the Dayton Rubber Co., Dayton, Ohio, died suddenly of a heart attack at his home in Dayton on April 8. He was 58 years old. A graduate of Virginia Polytechnic Institute in 1912, with a degree in electrical and mechanical engineering, Mr. Gordon had been associated with Dayton Rubber since 1945. From 1923 until 1942 he was director of engineering for the Kelly-Springfield Tire Co., in Cumberland, Md. As vice-president in charge of Navy production, Mr. Gordon was with the Patterson Foundry and Machine Co., East Liverpool, Ohio, from July, 1942, until August, 1943, when he took over the position of vice-president in charge of Navy contracts for the Herring-Hall-Marvin Safe Co., Hamilton, Ohio. From there he came to Dayton Rubber in 1945. Mr. Gordon also served for a time as consulting engineer for the Mansfield Tire & Rubber Co., Mansfield, Ohio. His articles on technical subjects appeared in many publications. Mr. Gordon was a Mason, a Moose and a Shriner. He was also a member of the American Institute of Electrical Engineers, the Southern Ohio Rubber Group, and the Dayton Foremen's Club. Funeral services were held on April 10, in Cumberland, Md. Surviving are his wife and two brothers.

Lawrence N. Brennan

Lawrence N. Brennan, assistant treasurer of the United States Rubber Export Co., with which he had been associated for more than twenty-five years, died at the firm's office at 1230 Avenue of the Americas, New York City, on April 17. Mr. Brennan, a resident of Yonkers, New York, was 53 years old. He joined the company in 1920 to do credit and collection work. Later he became manager of the collections department and in 1936 was promoted to assistant treasurer. Mr. Brennan was a past commander of Post No. 7, American Legion, and of the General Committee of War Veterans Organizations. He was formerly chairman of the Joint Veterans Relief Administration, at Yonkers, N. Y. His wife, a son and two daughters survive.

Albert H. Fisher

Albert H. Fisher, inventor of many products used in the rubber industry, died at his home in Cleveland, Ohio, on March 25, after several years of poor health. He was 80 years old. Mr. Fisher's tire wrapping machine is now widely used in most tire plantes. He also invented a non-rattling bus window of rubber and aluminum, as well as tire liners which reduced rim blowouts. His wife, three sons and two daughters survive.

Patrick Hanna

Patrick Hanna, one of the first tire makers to make and vulcanize pneumatic tires for automobiles, died on April 25, in Chicopee, Mass. Born in Fontonia, Ireland, Mr. Hanna came to Chicopee as a young man and began his career in the rubber industry in 1895, in the manufacture of bicycle tires in the Spalding and Pepper Co. plant in the city. Three years later he entered the employ of the Fisk Rubber Co. and remained with it until he retired ten years ago as foreman of the heat treating and vulcanizing departments. Working closely with the late Harry G. Fisk, Mr. Hanna helped surmount the technical difficulties encountered in advancing from the production of pneumatic bicycle tires to the development of larger and more rugged tires for automobiles. He supervised the vulcanizing operation in the manufacture of three single-tube tires for the first three-wheeled Knox car owned by Mr. Fisk, one of the founders of the Fisk Co., now a division of the U. S. Rubber Co.

Lloyd C. Daniels

Dr. Lloyd Cady Daniels, assistant director of the general technical division of the American Cyanamid Co., died on April 21, in New York Hospital, New York City, after a brief illness. He was 64 years old. Born in Cadillac, Mich., Dr. Daniels received his B. S. degree from the Georgia School of Technology in 1905 and M.S. and Ph.D. degrees in chemistry from the University of Pennsylvania in 1908. He was Assistant Professor of Chemistry at the University of Kentucky from 1908 to 1917, and a research chemist for the National Aniline and Chemical Co. in Buffalo, N. Y., from 1917 to 1927. In 1927, he became assistant technical director of the Selden Co., at Pittsburgh, Penna., and, after its acquisition by American Cyanamid, served as assistant general manager of the Selden division until 1938, when he came to the New York office of the parent firm.

Hubert B. Urtel

Hubert B. Urtel, general manager of the latex department of H. A. Astlett & Co., New York City, died suddenly while driving from Buffalo to Detroit on May 10. Death was caused by an old spine injury, aggravated by shock. He was 40 years of age. Mr. Urtel was born near East Aurora, N. Y., on May 13, 1908, and made his home in East Aurora for most of his life. For many years he served as assistant to the president and director of purchases of the Hewitt Rubber Corp. at Buffalo. Prior to joining Hewitt, he was engaged in the printing and industrial advertising agency business in Buffalo. He joined the Astlett organization on March 1 of this year.

Harvey J. Elwell

Harvey J. Elwell, president and a director of the General Latex and Chemical Corporation, Cambridge, Mass., died in Newton, Mass., on May 1. He was 54 years old. Born in West Haven, Conn., he attended West Haven High School, Lafayette College and the Sheffield Scientific School of Yale University, from

which he was graduated in 1916. Later, Mr. Elwell was employed by the Winchester Arms Co., and the Winchester Simmons Co. of Boston, Mass. In 1928 he entered the rubber field as manager of branches of the Cambridge Rubber Co. He became general manager of the Vultex Corporation of America and manager of the Vultex Chemical Co. in 1930, and four years later was elevated to the presidency. When the companies became the General Latex and Chemical Corporation, Mr. Elwell continued as president. During the recent war, the Government called on him to operate the Baytown, Texas, plant for the manufacture of synthetic rubber. He was later commended for his administration of the installation. Mr. Elwell was a member of the Yale Club of Boston, the American Chemical Society, the Brae Burn Country Club, Alpha Chi Rho and Sigma Xi. He leaves his wife, a son and a daughter.

W. R. Row

Word has been received of the recent death in England of W. R. Row, technical manager of the India Rubber, Gutta Percha, and Telegraph Works Co., Ltd. Mr. Row was well known in international rubber circles. He had been a member of the Institution of the Rubber Industry for the past twenty-two years, and served on several of its technical committees. He was also a member of the Rubber Industry Standards Committee of the British Standards Institute.

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Substantial quantities await your compounding needs. Both types of reclaim will save milling time and accelerator. You get such working qualities as body, consistency and aging properties. And remember . . . prices for natural rubber may rise even higher, so it's worth while to use these lower cost replacements today. Write for samples.

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66 Years Serving the Industry Solely as Reclaimers

DC MOLD RELEASE EMULSION NO. 35

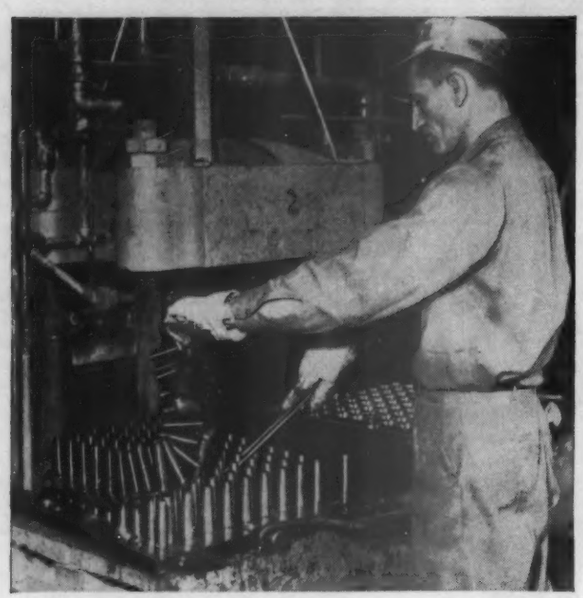

PHOTO COURTESY ANCHOR RUBBER PRODUCTS, INC.

Mold maintenance on this 81 cavity and precision pin mold was reduced to a minimum by using DC Mold Release Emulsion No. 35.

keeps mold clean 16 times as long

The experience of Anchor Rubber Products, Cleveland, Ohio, is a fine example of the savings which result from using DC Mold Release Emulsion No. 35. Prior to using this silicone release agent, they had a real problem in mold maintenance. A particular 81 cavity mold with precision pins for each cavity had to be disassembled and cleaned once a week in order to get satisfactory production. Ordinary lubricants carbonized and formed a build-up on an undercut portion at the base of the pin and on the plate. This build-up produced poor moldings, increased scrap and made weekly mold cleaning essential.

Removal of this carbonized soap was complicated since the pins had to be removed to do a thorough job. Replacing the pins after cleaning was also difficult and required hammering to align and seat the pin properly. The burrs left after hammering were then smoothed out with a grinder. But grinding shortened the pins to such an extent that the button flash on the end of the molding could not be removed. Then the pins had to be replaced.

Since using Dow Corning Mold Release Emulsion No. 35 as a mold lubricant, Anchor Rubber Products has used this same mold four months without cleaning. They simply dilute the emulsion 100 times with water and spray the mold.

In your plant, as in Anchor Rubber Products, there is no need to spend excessive amounts of time, money and labor for mold maintenance and cleaning. Dow Corning Mold Release Emulsion No. 35 neither carbonizes nor forms a build-up on the mold even after hundreds of hours at molding temperatures. It is clean to use and easy to apply.

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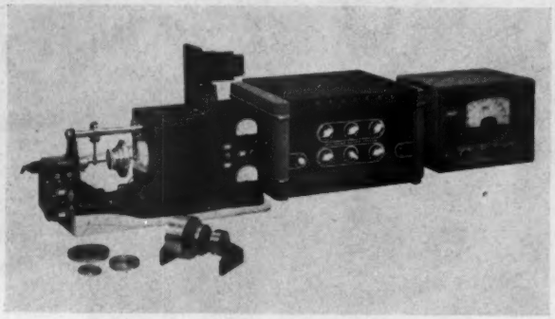
Dow Corning
FIRST IN SILICONES

NEW EQUIPMENT

Precision-Goodyear Vibrotester

The Precision Scientific Co., 3737 West Cortland Ave., Chicago 47, Ill., has made some information available on the Goodyear Vibrotester, a forced vibration device for measuring dynamic properties of rubber and rubber-like materials. According to the company, this instument enables a prediction of heat generation and



View of the Goodyear Vibrotester

relative service temperatures in various applications of rubber and also furnishes, in a general way, a criterion of the rubber-like quality of the polymer, its ability to deform and recover under the action of rapidly applied forces for the service range of temperatures.

Essentially, the Vibrotester consists of a vibrating system which includes a mass and the rubber under test. It is driven by electromagnetic forces on a coil carrying alternating current of controlled frequency in the field of a powerful permanent magnet. The system is tuned to resonance by variation of the mass, the frequency, or both. The mass and frequency at resonance determine the dynamic modulus; the amplitude and current, the internal friction of the rubber. From these values, dynamic resilience, hysteresis and relative rates of heat generation under constant force and constant amplitude conditions can be readily obtained (or calculated).

Tag Time-Schedule Controller

Finding application in the rubber and other industries utilizing timing devices, a new Tag Time-Schedule Controller produced by the C. J. Tagliabue Corp., 614 Frelinghuysen Ave., Newark, N. J., can be synchronized with any system of air-operated semi-automatic temperature and pressure control now in use to make the process fully automatic. In use, the operator begins the process by pressing the starter push button on the timer. A signal light above the button flashes on to indicate the process is under way. By means of an adjustable cam, timing begins immediately, or, if desired, when the temperature has reached the processing point. The temperature is maintained for the predetermined length of time. All valves—steam, air, drain, overflow and cooling water —are operated as the process may require. At the completion of the process and the cooling period, the signal light is extinguished, indicating visibly that the process cycle has been completed.

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ECONOMICAL PRODUCTION

EEMCO Hydraulic presses are built in all sizes for compression and transfer molding and other special uses. They can be furnished with self-contained individual pumping units or to be used with your present hydraulic system. Skillfully designed by qualified engineers EEMCO presses are extra heavy in construction. They save you money by increasing production and by lowering maintenance and operating costs.

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EEMCO hydraulic presses are built for specific production needs. Submit your requirements for prices.

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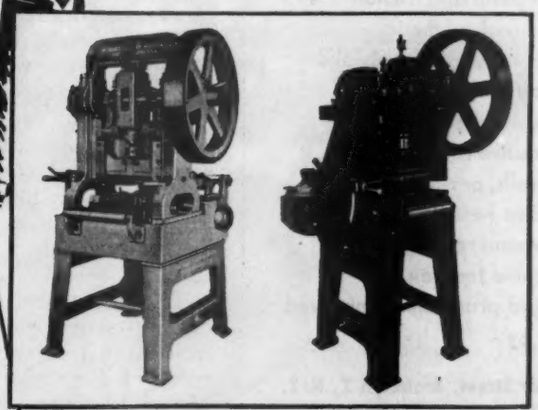
RUBBER CUTTING MACHINES

NEW Proven features for continuous volumetric control and stripping for HEELS-SOLES-TAPS and other molded products.

MODEL A-1



MODEL A-2 MODEL A-3

•Model A-1 For HEELS at high speed production, or short runs.
•Model A-2 For Multiple HEELS, HALF and FULL SOLES with stock grain.
•Model A-2S (Not Illustrated) For cutting crosswise of grain of stock.
•Model A-3 For Multiple HEELS and TAPS with or across stock grain.

Here is the *Rubber Cutting Machine* that will *cut with* or across the stock grain, either singular or in multiples—from a strip of stock direct from the warming mill.

WRITE FOR FULL PARTICULARS

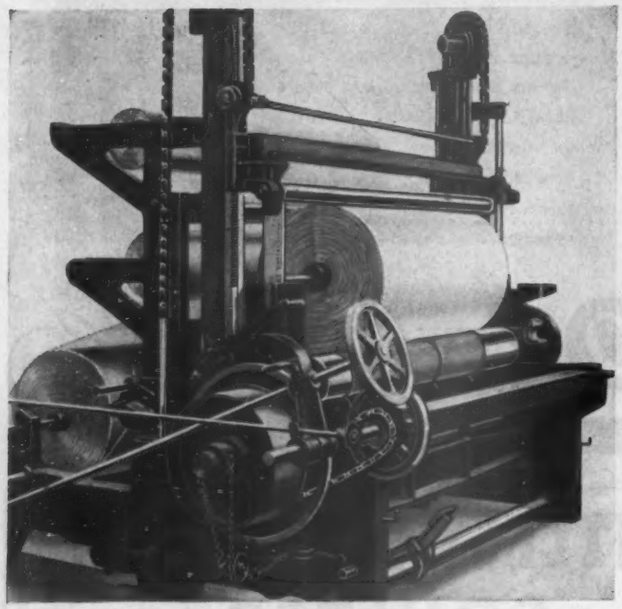
Production Machines Since 1896

The James COULTER Machine Co.

BRIDGEPORT • CONNECTICUT • U. S. A.

Camachine 10-20

for men with IDEAS!



CAMACHINE 10-20 is a mighty useful machine to have in a rubber plant. It's a fast, heavy duty slitter and rollwinder, and its outstanding quality is *versatility*. The 10-20 produces top quality rewound rolls from webs of all types of plain and friction coated fabrics, paper, rubber and synthetic rubber, from thin gutta-percha tape to heavy brake lining. It can be adapted to cut and wind strip as narrow as ½". It winds tacky rolls alternately on separate rewind shafts, for positive roll separation. It inserts liner cloth in rewound rolls, or rewinds liner from the original roll. It handles web up to 72" wide, and produces top quality rewound rolls up to 36" in diameter. Obviously a machine for men with practical ideas about increased production, improved quality and lower costs. Built by

Cameron Machine Co., 61 Poplar Street, Brooklyn 2, N. Y.

Camachines

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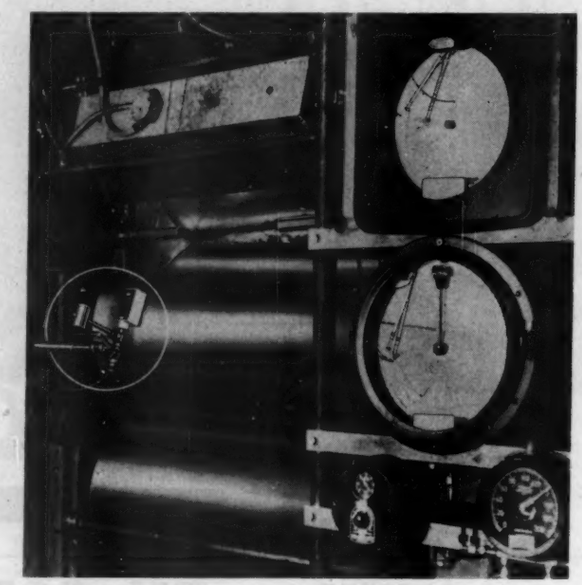
...the world over

Measuring Roll Surface Temperatures

Instruments for the accurate measurement and control of roll surface temperatures of calenders, dryers, and similar roll-type machine, have been announced by the Foxboro Co., Foxboro, Mass. Utilizing the well-known Foxboro recorders and controllers, the system features a new-type measuring head which gives the equipment extremely high sensitivity. In operating ranges between —40° F and +350° F., and at all ordinary operating



speeds, continuous temperature measurement is said to be assured within 2 degrees, and even higher accuracy is possible in individual installations depending upon conditions.

The measuring head is a small box-like unit, faced with low-friction material and containing a tiny but durable resistance element contacting a T-shaped spring of thin stainless steel, chromium plated. Pressure against the machine roll is constant and sure, but so light that no marking of the equipment or goods is incurred. The measuring head is connected by 3-wire cable of any length with a standard Foxboro Dynalog Temperature Recorder, with which a Model 40 Controller, of any control-action type desired, may be combined.

The element in the measuring head is, in reality, a miniature resistance bulb which has the highest sustained accuracy below 600° F. of any temperature measuring element. This new device is mounted on a block of Marinite for support, and to isolate it from all ambient temperature effects. It feels only the roll surface temperature.

The accompanying illustration shows an installation of a Foxboro roll surface temperature recording controller on a three-roll plastics calender. The two-pen recorder (top instrument), having a standard Foxboro Model 40 control mechanism, records surface temperature of the middle roll, and also sets the control point of a pressure controller (middle instrument) which controls the steam flow to the top and bottom rolls to maintain the desired processing temperature. The temperature measuring head (in circle), with adjustable counterbalance, bears gently on the roll surface, leaving no mark either on the roll or the material.

RUGGED-DEPENDABLE-ADAPTABLE

ROYLE PRODUCTS

Continuous Extruding Machines for the Rubber, Plastic and Chemical Industries

Continuous Vulcanizing Machines for Rubber Insulated Wire

Plastic Insulated Wire Machines

Light Wire and Cable Capstans

Strainers **Motorized Take-Ups**

Cooling Troughs **Temperature Control Units**

CONTINUOUS VULCANIZING MACHINE

JOHN ROYLE & SONS

ROYLE PATERSON N. J. 1880

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN

London, England	Home Office	Akron, Ohio	Los Angeles, Cal.
James Day (Machinery) Ltd.	E. B. Trout J. W. VanRiper	J. C. Clinefelter	H. M. Royal, Inc.
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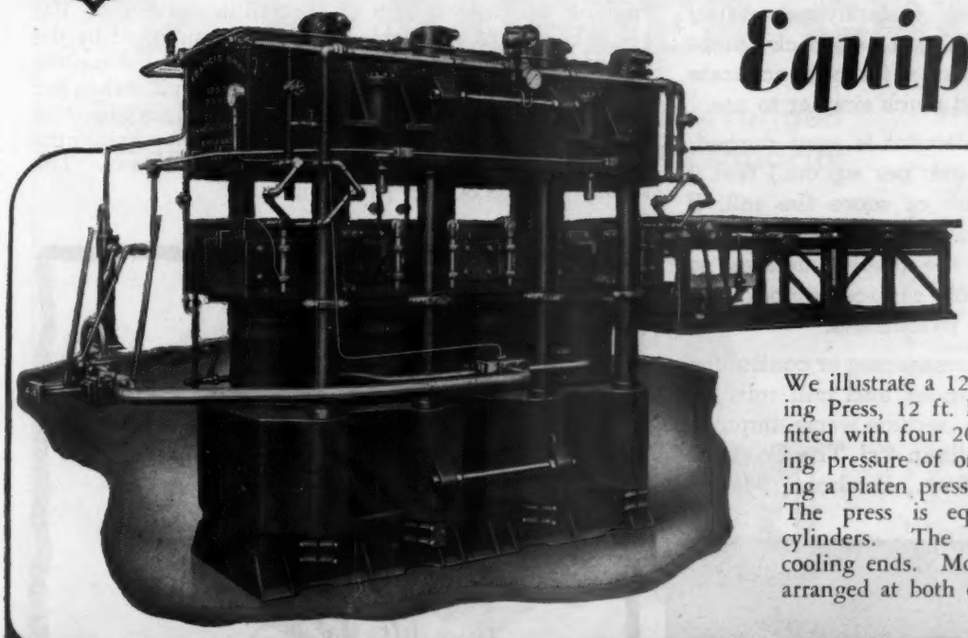
PATERSON 3, NEW JERSEY

SHAW

Hydraulic Vulcanizing Equipment



We illustrate a 1250 ton single daylight Sheeting Press, 12 ft. long by 3 ft. 6 inches wide, fitted with four 20" rams, suitable for a working pressure of one ton per square inch, giving a platen pressure of 450 lbs. per sq. inch. The press is equipped with four opening cylinders. The steel steam chests have 9" cooling ends. Motor driven drawtable can be arranged at both ends of the press if desired.

H 111

FRANCIS SHAW & CO. LTD. MANCHESTER 11 ENGLAND

Insert shows Foxboro Dynalog Electronic Controller. Installation shows measuring head which completely isolates element from ambient and radiant temperature effects. Operating range: −40°F. to +350°F., or higher under special conditions.

A UNIQUE, NEW FOXBORO SYSTEM

for Calender and Mill Rolls

AN ENTIRELY NEW type of measuring head coupled with the sensitive, instantly-responding Dynalog Recorder or Controller solves a tricky problem of long standing. This system is far more accurate than previous devices . . . and much simpler to use.

The Foxboro measuring element is very rugged, yet it bears so lightly (0.75 gm. per sq. cm.) that it avoids any tendency to mark or score the roll. It completely avoids errors due to friction, radiation and convection, as well as the inconveniences, so common to conventional, roll surface temperature bulbs and hand-held surface pyrometers.

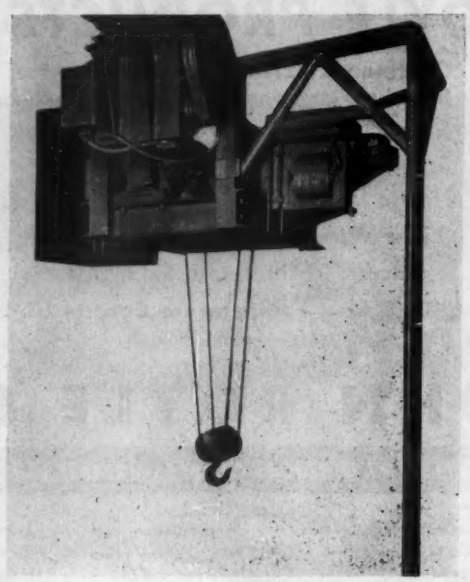
Here's the ideal system for measuring or controlling surface temperatures of calender and mill rolls . . . an opportunity to save steam, reduce waste, improve product quality. Write for Bulletin 405. **The Foxboro Company, 256 Neponset Ave., Foxboro, Mass., U. S. A.**

FOXBORO *Instrumentation*

INDICATING · RECORDING · CONTROLLING

Tramrail Dipping Machine

Specifically designed for use in dipping large, heavy equipment, the Tramrail Dipping Machine developed by the Miami Boiler and Machine Co., Inc., Akron, Ohio, has a hoisting load of 2000-pounds capacity. The rail for this machine is 13 feet 5½ inches from the floor. The



lateral distance between hook and control arm is 36 inches to accommodate dipping a globe of approximately 6 feet diameter without interfering with the control arm. However, if more space is needed, the arm can be swung back to permit passage. The electric current is for 220 Volt, 3 Phase 60 Cycle with trolleys running the entire length of the rail, a distance of 102 feet. The stepless variable speed is accomplished by the use of electronics and resembles the volume dial control of a radio. The minimum dipping speed is 2 inches per minute controlled through to 144 inches. Above this speed a switch is provided to instantly attain a maximum speed of approximately 280 inches per minute. The trolley speed is 80 feet per minute.

DOES PHILBLACK SPLICE ?

FOR FURTHER DETAILS, SEE AD ON PAGE 134

SIMPLEX
REG. TRADE MARK

RUBBER STRIP CUTTER

PATENTED

A PORTABLE machine capable of stripping slab rubber up to 1" thick at the rate of 20,000 feet in 8 hours. Any width desired.

SPECIAL FEATURES

- Has micro-adjustment for accurate widths.
- Equipped with water tank which feeds water to the slotted knife and to the cut.
- Has repulsion induction motor which carries any over loads.
- Automatic sharpener device keeps knife keen and sharp.
- Has base with rollers and is very easy to handle.

Cuts within 1/64 inch to 1/100 inch tolerance depending on grades of rubber. Cuts a slab down to the last shaving. Cuts all grades of rubber including pure gum, sponge, etc. Cuts squarely—no rejects.

Now in use by many leading Rubber Manufacturers & Jobbers

Simplex Cloth Cutting Machine Co., Inc.

Manufacturers of a Complete Line of Cloth Cutting Machinery

270 West 39th St. New York 18, N. Y.

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Fig. 18. Vulcanizer with inside car and outside transfer truck. Built to meet customers' requirements; all sizes.

BIGGS Vulcanizers are Standard Equipment in the Rubber Industry

Biggs-built vulcanizers and devulcanizers have always had a prominent place in the development of the rubber industry. For over 47 years Biggs has furnished single-shell and jacketed vulcanizers both vertical and horizontal, as well as many different types of devulcanizers. Biggs modern all-welded units with quick-opening doors are available in all sizes for various working pressures—with many special features.

Ask for our Bulletin No. 45-A

THE *Biggs* BOILER WORKS CO.

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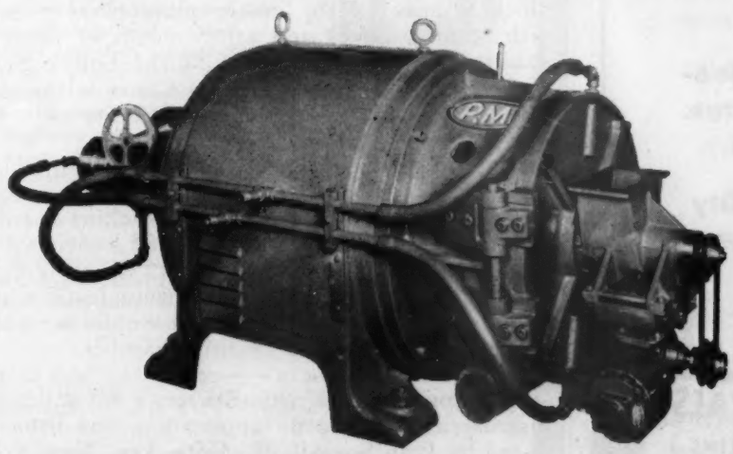
A New Heavy Duty **(TYPE X)**

P. M. RUBBER GRINDER

Developed to meet the need for a more rugged Scrap Rubber Grinder with increased capacity



RESEARCH ENGINEERING COMPANY

102-21 63rd Drive Forest Hills, L. I., N. Y.

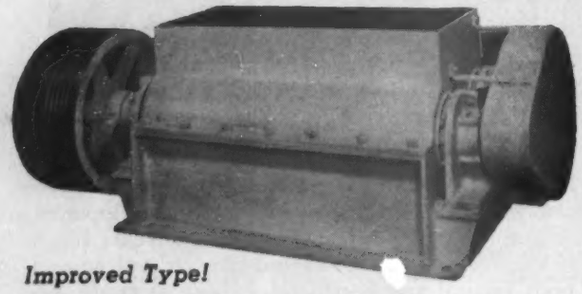
Features of Type X Grinder

- Available in Direct or Belt Drive.
- Belt Drive with standard 50 HP motor.
- Direct Drive with heavy duty shaft, powered by special 50 HP motor; no gears, no pulleys.
- Operation entirely automatic.
- Low operating cost.
- Feeding device can be regulated.
- Power gauge enables operation at full motor power without overloading.
- Water cooled to permit continuous operation without overheating.
- Finished product removed by blower insuring dustless operation.
- Fineness of ground rubber easily adjusted by simple turn of wheel.
- Capacity 400 to 800 lbs. per hour.

This new design incorporates every improvement suggested by years of specialized experience in building scrap rubber grinding machinery exclusively

ROBINSON
PROCESSING UNIQUE EQUIPMENT

SAW TOOTH Crushers



Improved Type!

Rugged construction. Crushes material to finished size. Blades spaced to your specifications. Capacity from 3 to 15 tons. Roller bearing mounted shaft. Robinson Processing Equipment designed by engineers whose reputation is founded upon doing things right. Literature available. Inquiries invited.

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NA-11

ACCELERATOR FOR NEOPRENE AND NEOPRENE LATEX

by

DU PONT

★ **Increases Rate of Cure of Neoprene and Neoprene Latex**

★ **Safe Processing**

★ **Does Not Affect the Stability of Neoprene Latex Compositions**

★ **Readily Dispersed**

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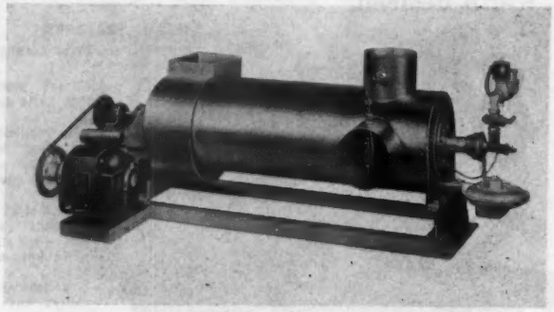
E. I. DU PONT DE NEMOURS & Co. (INC.)
WILMINGTON 98, DELAWARE
BETTER THINGS FOR BETTER LIVING ...THROUGH CHEMISTRY
DU PONT

Midget Utility Air Heater

The Midget Utility Air Heater with improved design features is now available as a complete package unit from the Gas Appliance Service, Inc., 1211 Webster Ave., Chicago 14, Ill. In addition to the heater, the package



includes fan, motor, drive, safety devices and temperature controller. With a heating capacity of 125,000 Btu per hour, the heater is suitable for temperatures up to 350°F. The bricklined combustion chamber affords complete combustion of gas. The fan capacity is 1000 cubic feet of air per minute. The air can be recirculated for greater fuel economy. Both the burner output and air volume can be regulated for progressive temperature control and air circulation. Temperature controls of either the indicating or non-indicating type are furnished as desired. The safety devices are designed to shut off the gas supply in case of flame, power or fan failure.

Palmer-Shile Co., Detroit 27, Mich., has developed a new type of **all-steel skid** with end racks, especially designed for handling heavy loads with ease and safety. The end racks, which are removable, facilitate loading and unloading. It is said to be excellent for handling hot metal parts, and can be built with ventilated bottom.

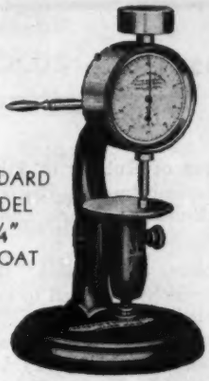
A new type of **packless valve** which is said to far surpass the service limitations of conventional valves in pressure or vacuum, as well as temperature, and which eliminates the costly maintenance required with stuffing boxes and other means of preventing leakage, has been announced by the Fulton Sylphon Division of Robertshaw-Fulton Controls Co., Knoxville, Tenn. It is called the No. 3000 Series.

Hydraulic Press Mfg. Co., Mount Gilead, Ohio, has announced the recent development of a large capacity **thermoplastic injection molding machine** capable of molding 40 ounces of acetate or 32 ounces of polystyrene per cycle. The new unit, which is entirely automatic, molds all types of thermoplastic material, although the handling of vinyl-vinylidene chloride requires a special alloy heating chamber.

The **Rosinger Magnetic Stirrer,** a novel laboratory instrument of versatile application, has been introduced by Ivan Sorvall, 210 Fifth Ave., New York 10, N. Y. The principle of operation of the stirrer is to cause a magnetic bar, covered with a protective coating, to rotate in a liquid contained in a vessel of nonmagnetic material. The rotation of the magnetic bar (or rotor) stirs the liquid.

RANDALL & STICKNEY

THICKNESS GAUGES FOR RUBBER



STANDARD MODEL 1¾" THROAT

THROAT DEPTHS
1¾" to 26"
FOOT TENSIONS
supplied by Internal Spring or Direct Weights
FOOT DIAMETERS
⅛" to 1¼"
ROLLS
Table and Roll or two Rolls
RANGE
½" or 1", also 1 CM Metric

26" DEEP THROAT MODEL

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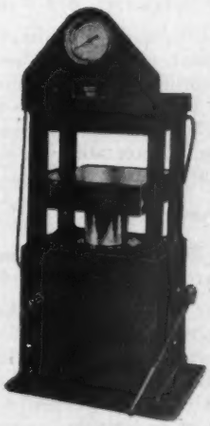
FRANK E. RANDALL CO.
248 Ash St., Waltham 54, Mass., U.S.A.

HOT PLATE MOLDING PRESS
Engineered for Rubber and Plastics

- **Low Cost Operation**
- **Self-Contained**
- **Sturdily Built**
- **Prompt Delivery**



The M & N 30 ton electric hot plate molding press is specially designed for the rubber and plastics industries where speed and ease of operation are essential to low cost production. It is readily adapted for production runs or laboratory control work.

Available with any number of openings. Steam heated or electric platens available at slight cost. Larger platens and motor-driven hydraulic power units are also available. Features of this M & N press include the visual ture indicator, dual pressure hand pump, electrically heated and thermostatically controlled platens, all steel construction, and large platen areas.

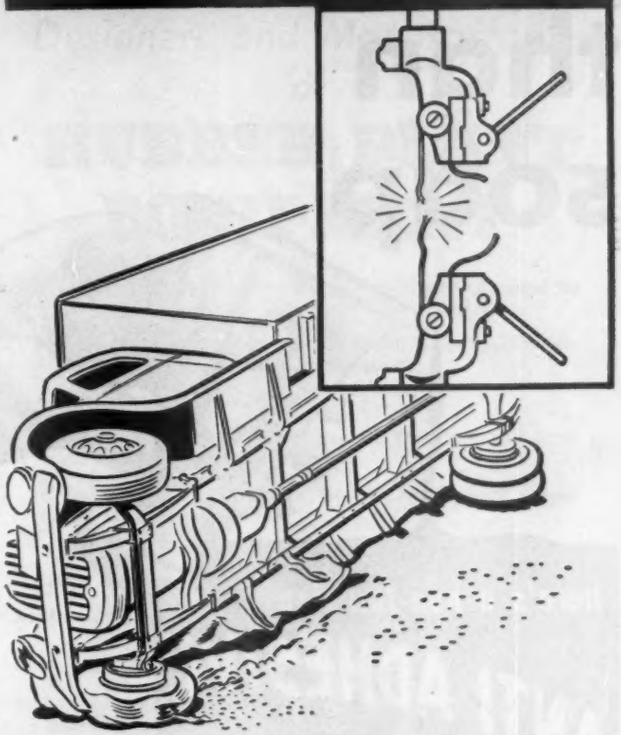
SPECIFICATIONS

SIZE OF BASE	16" x 12"	DAYLIGHT OPENING	10"
OVERALL HEIGHT	42"	STROKE	6"
PLATEN SIZE	12" x 12"	RAM DIAMETER	5"
CAPACITY	30 tons	APPROX. WEIGHT	400 lbs.

HYDRAULICS DIVISION

M & N MACHINE TOOL WORKS, Inc.
148 Orono Street Clifton, N. J.

TESTED IS TRUSTED



Was this a TIRE CORD failure?

* Scott Tester IP-4 is standard for tire cords. Operating on the exclusive Inclined-plane principle, it combines highest precision with adequate ruggedness for continuous production testing. World-standard tests; "picturized" graph results.

"Adequate Testing Always Pays"

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SCOTT TESTERS, INC.
85 Blackstone Street • Providence, R. I.

Standard of the World

better than soap

here's a non-foaming

ANTI ADHESIVE

IN LIQUID FORM . . .

TEXOLUBE-R

While soap eliminates most of the dust conditions in a Rubber Plant it is only partially effective as an anti-adhesive, and in turn creates new problems of excess foaming, mill slippage, and uneven protection.

TEXOLUBE-R is not soap . . . it is a fluid concentrate that offers many important advantages over ordinary soap . . . giving complete anti-adhesive qualities and eliminating at one stroke, the disadvantage of both talc and soap.

The advantages of TEXOLUBE-R can easily be determined in simple laboratory tests. Send for a free one gallon sample.

THE TEXO CORP.
DANA & FLORAL
CINCINNATI 7, OHIO

TEXO

REVIEWS

BOOKLETS, CATALOGS, etc.

Estimation of Small Percentages of Rubber in Fibrous Materials. By C. M. Blow. Issued by the British Rubber Development Board, Market Buildings, Mark Lane, London E.C. 3, England. 5½ x 8½ in. 8 pp.

Number 7 in the series of booklets on "Positex," this booklet discusses the three techniques currently employed to estimate the percentage of rubber in the treated fibrous product. The three techniques are: (1) Destruction of the fiber by a chemical reagent which is without effect on the rubber; (2) Use of solvents to remove the rubber without affecting the fiber; (3) Oxidation or, more generally, chemical modification of the rubber to render it more readily removable from the fiber by extraction with a solvent or by emulsification with a detergent. It is explained that no single method can be adopted because of the difference in behavior of the various fibers.

•

Statex B. (Bulletin No. 142). Binney & Smith Co., 41 East 42nd St., New York 17, N. Y. 8½ x 11 in. 8 pp.

Advantages offered by Statex B, a fine furnace carbon black, in heavy duty tread compounds and in blends for passenger tread and similar compounds are emphasized in this bulletin. A number of typical compounds are shown and compared with compounds containing other types of black. Physical test data is shown in each case, with data on all cures depicted by special data sheets attached to the bulletin. General applications of Statex B are also outlined in the bulletin, including mechanicals, wire, heels and soles, and footwear.

•

NA-11—An Accelerator for Neoprene and Neoprene Latex. By R. R. Radcliff and R. H. Walsh. Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Delaware. 6 x 9 in. 12 pp.

The specific advantages of NA-11, a relatively new accelerator, in the compounding of neoprene and neoprene latex are outlined in this technical report. Physical test data on three typical compounds is shown, including modulus, tensile, elongation, hardness, compression set, and scorch. The use of sodium acetate as a retarder for NA-11 is discussed. Application of the accelerator with neoprene latex includes both films deposited from such latex and latex foam.

•

The Fifth Commandment. Travelers Insurance Companies, Hartford, Conn. 6 x 9 in. 32 pp.

The importance of the fifth fundamental commandment, "Thou Shalt Not Kill," is stressed in this latest report of highway accidents. It is an analysis of the 1947 traffic accident record. Tables are used to show the types of accidents resulting in deaths and injuries, actions of drivers, actions of pedestrians, persons killed (by age groups), persons injured (by age groups) and age groups of drivers in accidents. Emphasizing each section is a short story depicting the tragic effect of accidents on family life in general.

•

Chromium: The Shield of Protection. Chromium Corp. of America, 120 Broadway, New York 5, N. Y. 8½ x 11 in. 36 pp.

Designed to provide helpful information for successful applications of industrial chromium plating, this profusely illustrated pamphlet outlines the accomplishments of chromium plating, and describes performance that might be expected under known operating conditions. Tables and charts describing the characteristics of chromium plating are included.

SMACO GASKET SPLICER
and
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- MOLDS
- EMBOSSES

FEATURES

• Speed of operation • One operator handles up to six units • No mechanical breakdowns • Heat controls in both platens • Splices gaskets up to 3" in diameter, right angles or T-joints

SPECIFICATIONS

Bench Space 5" x 6"—Bench Overhang 9"
Height 14"—Hardened Cam and Anvil
Bronze or Hardened Aluminum Platens
Chromalar Heaters—Fenwal thermostats
Mold Sizes—1½" x 2" x 4" and 2" x 3" x 6"
Pressure Adjustments on Anvil
Current—110 or 220 Volts

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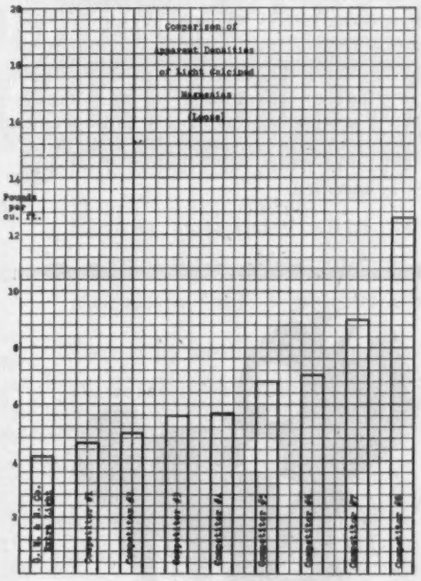
WHY EXTRA LIGHT CALCINED MAGNESIA?



The effectiveness of Extra Light Calcined Magnesia is largely due to its enormous surface area. The lighter the Magnesia, the greater the effective area—and the lower the cost per batch. All pure Calcind Magnesias have the same specific gravity, but not the same apparent density. The physical structure of Extra Light Calcined Magnesia which makes it so useful in Neoprene stocks is the result of the method of manufacture.

Note the chart—and that General Magnesite's Magnesia is the lightest of all!

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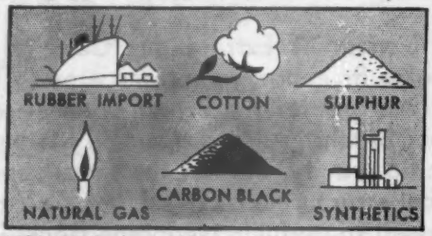
HOW TO CUT COSTS
by locating your new plant
IN NEW ORLEANS

More available raw materials, more economical transportation, more accessible markets . . . mean more profitable operation.

MARKETS are bigger and more accessible from New Orleans. Not only the 30,000,000 people in the 10-state Southern Market, but the entire mid-continent area and Latin America can be quickly and economically reached from the South's largest, most prosperous city.

TRANSPORTATION is more economical—both for your nearby raw materials and for your finished product. A network of inland waterways, a port second only to New York in activity, efficient rail and air transportation are right at your door.



RESOURCES for rubber production are more available in New Orleans. Carbon black, cotton, sulphur are all abundant in this area, plus the ideal fuel—natural gas. New Orleans is the gateway for natural rubber imports.

TAXES are lower, with a 10-year exemption plan for new and expanding industries.

CLIMATE is healthful, free of extremes, beneficial to all-year efficient production.

LABOR is plentiful, skilled, dependable. Lower living costs are conducive to better labor relations.

SEND FOR YOUR COPY

of our industrial study, "Opportunities in New Orleans for Manufacturers of Rubber Products" Address: Dept. 55-B, Greater New Orleans, Inc., 1024 Maison Blanche Bldg., New Orleans 16.

GREATER NEW ORLEANS

REVIEWS (CONT'D)

Sodium Acetate as an Activator of Neoprene Vulcanization. (Report No. BL-221.) Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Wilmington 98, Delaware. 6¼ x 9½ in. 8 pp.

The use of sodium acetate, both in crystal and in solution form, as an activator of neoprene vulcanization is discussed in this report. It is indicated that sodium acetate, while functioning as a retarder at processing temperatures and during short cures, activates the vulcanization of neoprene compounds which are cured longer than 50 minutes at 281° F. Use of the solution form results in a faster cure at the same temperature.

•

Severance Midget Mills. (Bulletin No. 16-M). Severance Tool Industries, 635 Iowa St., Saginaw, Mich. 8½ x 11 in. 12 pp.

Issued as a supplement to the company's general catalog, this bulletin lists the various midget cutting tools featured by the concern. The new micro-mills listed in the bulletin are finishing with one or two passes jobs that usually require two or three wheel dressings and multiplied passes per dressing with internal grinding wheels. The bulletin also lists the company's ground carbide hand files and die machine files, and contains data on the various patterns of cut, tooth characteristics and pitches of teeth.

•

Canada Protects Her Heritage. Standard Chemical Co., Ltd., Toronto, Ontario, Canada. 8½ x 11 in. 32 pp.

This booklet presents in printed form the six papers given at the Symposium on Conservation and Research in Canada under the auspices of the Chemical Institute of Canada at Toronto in June, 1946. The six papers were as follows: (1) The Scientist and the Engineer in Conservation; (2) Conserving Today's Soil for Tomorrow; (3) Forests and Forestry in Canada; (4) Water Conservation; (5) Basic Research in the Small Company; (6) Government, Research and Industry.

•

Iron Lung For Industrial Buildings. Powermatic Ventilator Co., 4019 Prospect Avenue, Cleveland 3, Ohio. 8½ x 11 in. 32 pp.

The mechanical details of this relatively new type of industrial ventilating system are examined in this handsomely bound and illustrated catalog. Dimensions and specifications of the unit are given, as are the methods of application of the ventilator. A partial listing of users of Iron Lungs in the United States is supplied.

DOES PHILBLACK SPLICE ?

FOR FURTHER DETAILS, SEE AD ON PAGE 134

CRUDE AND SYNTHETIC RUBBER

M&B

The
Meyer & Brown Corp.
Founded 1894
347 Madison Avenue, New York 17, N. Y.

NEOPRENE COMPOUNDERS!

investigate Baker's
CALCINED MAGNESIA

Baker supplies what neoprene compounders demand—Calcined Magnesia that is always uniform.

Test it in wetting power—in ease of dispersion—stability of compounded stock—rate of cure—tensile strength and plasticity.

Learn why Baker's Light Calcined Magnesia is better.

Send for free samples

J. T. BAKER CHEMICAL CO.
Phillipsburg, New Jersey

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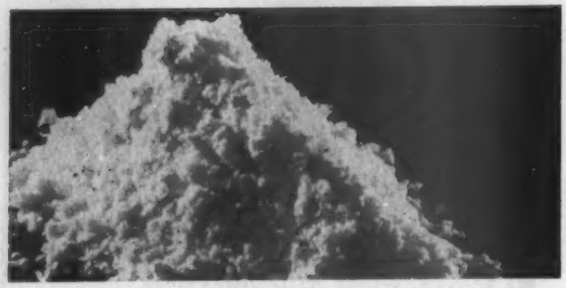
For Non-Marking Sole Compounds



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Early in our pioneering efforts as flock producers, we recognized that the special needs of the Rubber Industry call for a special group of fillers. Here in "Filfloc" is a product developed specifically to enhance strength, as well as impart non-marking qualities. Through experience and joint research with you, we furnish various types of "Filfloc" to meet EXACTLY your needs for compounding crude, synthetic or reclaim.

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Rayon Processing Co. of R. I., Inc.

PIONEER PRODUCERS OF COTTON FILLERS FOR PLASTICS

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Modern Baking, Drying and Heating With Westinghouse Industrial Infrared Lamps. Westinghouse Electric Corp., Pittsburgh 30, Penna. 8½ x 11 in. 16 pp.

Radiant heat processing for rubber, plastics, textile, leather, graphic arts, paper, woodworking, glass and other industries is described in this booklet. Case histories are given to show how infrared cut costs, speeds production and saves space, A check list of applications for which it is now being used names more than 70 operations and processes in a wide variety of industrial plants. The booklet discusses four major types of installations—the portable or non-oven type, the single-walled oven, the double-walled oven, and the insulated oven. Application data to aid in planning installations is included.

•

Indian Rubber Industry (Plantation & Manufacturing). Edited by R. N. Sengupta. National Rubber Manufacturers, Ltd., Leslie House, 19, Chowringhee Road, Calcutta 13, India. 5 x 8 in. 30 pp.

This is the first of a series of publications on the rubber industry in India. The technical, financial and commercial aspects of the industry as it exists in India are considered. A brief history of the industry is offered. The industry is considered in the light of a comparison with the U. S. rubber industry, while matters of production and exports, government control and assistance are discussed. An appendix lists a schedule of raw rubber prices, and a schedule of import duties on rubber goods.

•

GR-S-10 and Other Rosin Type GR-S Polymers. Office of Rubber Reserve, Washington 25, D. C. 8½ x 11 in. 16 pp.

The special properties and recommended applications of GR-S-10, a butadiene-styrene copolymer manufactured in the same manner as regular GR-S except that a dehydrogenated rosin soap is used as a polymerization emulsifier instead of fatty acid soap, are outlined in this report. Typical compounds incorporating the polymer are shown, with physical test results given. Comparisons with standard GR-S are made. Some data on other rosin polymers is given in the report, including GR-S-10-AC, GR-S-16, GR-S-17, X-325-GRS, X-274-GR-S, and GR-S-18 (formerly X-382-GR-S).

•

Silastic Facts (No. 5). Dow Corning Corp., Midland, Mich. 8½ x 11 in. 16 pp.

New and more complete data on all commercially available types of Silastic, the Dow Corning Silicone Rubber, are given in this booklet. Several new types of Silastic are included among the six pastes and six molding and extruding stocks for which typical physical properties including hardness, tensile strength and elongation are given. Data indicating the stability of the product are offered, as are graphs which outline the uses to which the silicone rubber may be put. The usefulness of Silastic as an electrical insulating material is indicated in tables of dielectric properties and graphs showing changes in dielectric constant and power factor at frequencies ranging from 100 to 100,000,000 cycles per second.

•

Taking the Guesswork out of Lubrication. Gerin Corp., Red Bank, N. J. 8½ x 11 in. 8 pp.

This pamphlet illustrates simple, but accurate and official, methods within the skill of engine attendants, for measuring contaminants in lubricating oil. It shows how to measure the entire group of contaminants considered responsible for all engine deposits; water, dirt and scuff metal; fuel dilution through viscosity; and a check on acidity. Equipment for conducting the tests, which it is claimed can be performed by an engine attendant in one-half hour per week per engine, is described.

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Synthetic Rubbers

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DU PONT

REVIEWS (CONT'D)

Truck-Bus Rims. Rubber Manufacturers Association, 444 Madison Ave., New York 22, N. Y. 8½ x 11 in. 16 pp.

New rims recently introduced, and now currently in use, provide a tight bead seat on both sides of the rim. Improper mounting and removal of tires from such rims may cause severe damage to the tire if too great a force is applied with makeshift tools in attempting to loosen the bead from the rim. This booklet outlines the proper methods to be used for such removal in a careful step-by-step treatment. Procedures to be followed for all kinds of truck rims in use at the present time are illustrated in order to clear any confusion as to the methods of mounting and removing tires on and from both the old and the new type rims.

•

Opportunities in New Orleans to Manufacturers of Rubber Products. Greater New Orleans, Inc., 1024 Maison Blanche Bldg., New Orleans 16, La. 9 x 11½ in. 24 pp.

Factual information about New Orleans, specifically designed for rubber manufacturers seeking locations for new manufacturing plants, is contained in this bulletin. Pointing out that New Orleans is a strategic location from which to serve both the fast growing Southern market and the export market represented by Latin America, the bulletin gives data on population, buying income, transportation and shipping facilities, and raw material sources. Copies are available on request.

•

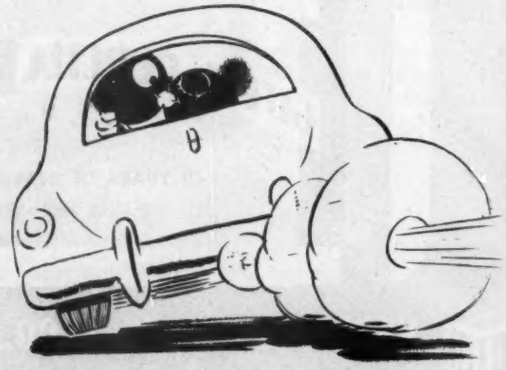
Electro-Hydraulic Tensile Strength Tester. Thwing-Albert Instrument Co., Penn St. and Pulaski Ave., Philadelphia 44, Penna. 8 x 10½ in. 16 pp.

Concise yet complete information on the company's well-known electro-hydraulic tensile strength tester is given in this booklet. Among the material included is a brief historical background, break-down of the instrument into component parts, diagrams and pictures, models and ranges available, operational details, accessory items, and similar data. Standard range calibrations are also included.

•

Taylor Electric Contact Controller. (Bulletin No. 98098) Taylor Instrument Companies, P. O. Box 110, Rochester 1, N. Y. 8½ x 11 in. 4 pp.

This bulletin graphically describes the new Taylor Electric Contact Controller (indicating or recording) for on-off applications involving temperature, pressure, flow, liquid level, or humidity, such as ovens, driers, heaters, vats, cookers, tanks, etc. Photographs and construction and application drawings indicate how the new controller can be applied to specific problems.



DOES PHILBLACK SPLICE ?

FOR FURTHER DETAILS, SEE AD ON PAGE 134

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HARWICK STANDARD CHEMICAL CO.
Akron, Boston, Trenton, Chicago, Denver, Los Angeles

MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, MAY 11, 1948

Natural Rubber

The price of spot rubber on the Commodity Exchange has swung in the relatively low range of 94 cents since our last report (April 9), high for the period being 23.75 cents, reached on May 3, and low 22.81 cents on April 27. The average price of spot rubber for the month of April was 22.87 cents, based on 22 trading days. This compares with the average of 20.33 cents for March.

The price was firm throughout the entire period, quotations continuing for days on end without change. Rarely has a market ignored so many factors, both bullish and bearish, as has been the case of natural rubber in recent weeks. While sentiment leans to higher prices, there is little evidence of aggressiveness on the buying side. Even recurring reports of labor difficulties in the Far East, where several strikes are known to have occurred, have had little effect on the price situation.

Malayan exports of rubber during April amounted to 67,465 long tons, a drop from the 71,953 tons shipped in March. Of the April amount, 24,654 tons were shipped to the United States as compared with 23,567 tons in the preceding month. Trade sources in Singapore report that Russia is heavily increasing her purchases of Malayan rubber, with some 15,000 tons in March. The Russians are also reported to have made inquiries for larger amounts in the next several months.

Today's quotations in the outside market, London and Singapore, follow:

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.23⅝
June	.22¾
July-September	.22⅛
Spot	.26½
June	.26
Thin Brown Crepe, No. 2	.17¾
Ambers, No. 3	.17¼
Flat Bark Crepe	.12¾

London Market

(Standard Smoked Sheets)

July-September	21.46 - 21.67
October-December	20.83 - 21.04

Singapore Market

(Standard Smoked Sheets)

June	20.09 - 20.20

Synthetic Rubber

(Dry Types)

Butaprene NF	.390 - .415
Butaprene NL	.400 - .425
Butaprene NAA	.440 - .465
Butaprene NXM	.470 - .495
Chemigum 30 N4NS	.400 - .470
Chemigum 50 N4NS	.400 - .470
Chemigum N3	.450 - .520
Hycar OR-25	.400 - .425
Hycar OR-15	.470 - .495
Hycar OS-10	.400 - .425
Neoprene Type E	—— - .650
Neoprene Types CG and AC	—— - .500
Neoprene Types FR and KNR	—— - .750
Neoprene Type S	—— - .320
Neoprene Type NC	—— - .250
Perbunan 18	.390 - .415
Perbunan 26	.400 - .425
Perbunan 35	.470 - .495
Thiokol Type A	.370 - .470
Thiokol Type ST	.750 - .850
Thiokol Type FA	.520 - .620
Thiokol PR-1	.750 - .850

Scrap Rubber

The scrap rubber market continues exceedingly dull, with very few demands or shipments. In view of the forthcoming summer season, with accompanying plant shut-downs for vacations and taking of inventory, the situation is not expected to change for the next several months. Current quotations follow:

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	$12.00
Beadless truck tires	ton	nom.
Mixed truck tires	ton	nom.
Beadless passenger tires	ton	nom.
No. 1 passenger peelings	ton	42.50
No. 1 truck peelings	ton	42.50
Red passenger tubes	lb.	.06
Black passenger tubes	lb.	.03¾
Mixed passenger tubes	lb.	.03¾
No. 2 truck tubes	lb.	nom.
Red truck tubes	lb.	nom.
Black truck tubes	lb.	.03½
Buffings	ton	15.00

Reclaimed Rubber

Demand for reclaim continues fair, varying somewhat with the individual reclaimers. Consumption of reclaim in March amounted to 24,719 long tons, an increase over the 22,374 used in February. Consumption for the first quarter of this year totaled 72,978 long tons, as compared with 79,356 tons in the corresponding 1947 quarter. Current quotations follow:

Tires			
Black, Acid	lb.	.08¾ @	.09¼
Black, Digester	lb.	.08 @	.08½
Peels	lb.	.09 @	.09½
GR-S Whole Tire	lb.	.08½ @	.09
Inner Tubes			
Black	lb.	.12¾ @	.13¼
Red	lb.	.13½ @	.14
GR-S	lb.	.09½ @	.10
Butyl	lb.	.08½ @	.09
Shoe			
Unwashed	lb.	.08¾ @	.08¾

Cotton Tire Fabrics

Demand for cotton tire fabrics and chafers has practically ceased in the past few weeks. Even the stepping up of tire production by several of the larger tire companies has had no effect on the situation. The fact that several smaller tire manufacturers have closed down temporarily or have laid off substantial numbers of workers is another deterring factor. No change has been made in the price structure. Current quotations follow:

Standard, Peeler, 12/4/2	lb.	.7600
Standard, Peeler, 14/4/2	lb.	.7800
Standard, Peeler, 16/4/3	lb.	.8050
Extra Staple, Peeler, 12/4/2	lb.	.8575
Extra Staple, Peeler, 14/4/2	lb.	.8775
Extra Staple, Peeler, 16/4/3	lb.	.9025

Chafers

14.4 oz. (per sq. yard)	lb.	.7550
9.25 oz. (per sq. yard)	lb.	.7125
11.65 oz. (per sq. yard)	lb.	.6850
8.9 oz. (per sq. yard)	lb.	.7275

Cotton

The price of middling uplands on the Cotton Exchange has swung in a range of 2.06 cents since our last report (April 9), high for the period being 39.63 cents on April 21, and low 37.57 cents on May 5. The average price of middling uplands for the month of April was 38.10 cents based on 26 trading days. This compares with an average of 35.04 cents for the month of March.

The Agriculture Department, in a revised report, estimated the 1947 cotton crop at 11,851,000 bales of 500 pounds gross weight. This was an increase of 157,000 bales over the Department's last previous estimate made last December. The crop was 3,200,000 bales more than the small 1946 crop but 539,000 bales less than the 1936-45 average.

The Board of Trade of the Japanese Government has announced the establishment of a cotton purchasing committee to handle offers. This move indicates a close liaison with the spinner's efforts to make transactions approximate normal commercial dealings.

The 1948 Mexican cotton crop, which will be harvested from August through November, is expected to show an increase over last year's output of about 22%. This would mean a production of about 565,000 bales of 478 pounds each compared with last season's total of 465,000 bales. The carryover in Mexico is estimated at about 150,000 bales, which, together with new-crop cotton, will put the total supply at 712,000 bales as compared with 650,000 bales last year.

Quotations for middling uplands on the Exchange follow:

	Apr. 10	May 11		
	Close	High	Low	Close
July	35.91	37.32	36.89	37.07
October	32.40	33.90	33.60	33.76
December	31.73	33.25	32.90	33.08

Closing Rubber Prices on New York Commodity Exchange

FROM APRIL 12 TO MAY 11

Date	Spot	May	July	Sept.	Dec.	Sales
April						
12	23.12	22.05	21.05	20.60	20.40	43
13	23.12	22.15	21.10	20.65	20.40	37
14	23.12	22.10	20.90	20.50	20.25	70
15	23.12	22.15	20.99	20.50	20.30	164
16	23.12	22.00	21.00	20.55	20.35	118
17	——	——	——	——	——	——
18	——	——	——	——	——	——
19	23.12	22.25	21.15	20.70	20.50	72
20	23.12	22.40	21.30	20.75	20.60	42
21	23.25	22.70	21.40	21.00	20.70	223
22	23.25	22.84	21.55	21.14	20.90	161
23	23.37	22.95	21.65	21.10	20.95	116
24	——	——	——	——	——	——
25	——	——	——	——	——	——
26	23.25	22.90	21.59	21.00	20.95	41
27	22.81	22.46	21.18	20.65	20.50	133
28	23.37	22.65	21.45	20.95	20.75	59
29	23.62	23.00	21.40	20.90	20.70	179
30	23.50	22.85	21.20	20.70	20.50	95
May						
1	——	——	——	——	——	——
2	——	——	——	——	——	——
3	23.75	23.00	21.35	20.85	20.60	67
4	23.75	23.25	21.50	21.00	20.85	180
5	23.75	23.51	21.75	21.25	21.00	72
6	23.75	23.60	22.05	21.50	21.30	59
7	23.75	23.25	22.05	21.45	21.30	43
8	——	——	——	——	——	——
9	——	——	——	——	——	——
10	23.50	23.10	21.98	21.35	21.15	27
11	23.50	22.95	21.86	21.30	21.10	38

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555 South Flower Street, Los Angeles 13, Cal.
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STATISTICS *Of Interest to the Rubber Industry*

U. S. Imports and Re-Exports of Natural Rubber

	GROSS IMPORTS												
	Natural Rubber (Dry)			Natural Rubber (Latex)			Guayule				RE-EXPORTS		TOTAL NET IMPORTS
Year	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Total Gross Imports Long Tons	Long Tons	Total Declared Value	Long Tons
1936	467,064	152,072,496	14.54	19,852	6,659,899	14.98	1,229	286,552	10.41	488,145	12,581	4,488,223	475,564
1937	574,600	237,307,041	18.44	23,185	10,213,670	19.67	2,694	745,873	12.36	600,479	7,902	3,385,433	592,577
1938	397,620	125,357,730	14.07	11,878	4,147,318	15.59	2,485	623,819	11.21	411,983	5,652	1,799,124	406,331
1939	469,803	167,558,245	15.92	27,438	10,467,552	17.03	2,232	463,345	9.27	499,473	13,125	5,832,618	486,348
1940	780,820	303,117,726	17.33	33,789	14,593,466	19.28	3,634	758,007	9.31	818,243	7,060	3,197,136	811,183
1941	989,329	401,890,393	18.14	34,798	15,965,627	20.48	4,881	1,145,767	10.48	1,029,008	5,376	2,757,872	1,023,632
1942	265,980	112,377,896	18.86	10,646	5,630,667	23.61	5,523	1,660,792	13.42	282,149	10,856	5,913,386	271,293
1943	50,348	31,364,033	27.81	1,890	1,312,202	30.99	7,679	3,636,789	21.14	59,917	22,587	16,446,707	37,330
1944	103,820	73,908,389	31.78	3,091	2,092,211	30.22	6,700	3,351,233	22.33	113,611	9,739	8,712,695	103,872
1945	134,454	95,850,441	31.82	4,773	3,115,853	29.14	10,040	5,963,797	26.52	149,267	9,509	7,201,746	139,758
1947	690,954	306,919,456	19.83	17,722	9,820,080	24.91	2,880	1,492,825	20.30	711,556	4,122	2,354,494	707,434
1946:													
June	8,518	6,132,895	32.15	561	366,165	29.15	466	244,580	23.41	9,545	460	446,253	9,085
July	20,641	13,947,817	30.17	696	451,523	28.96	291	148,442	22.85	21,628	2,457	1,600,600	19,171
Aug.	34,125	18,656,966	24.41	1,231	803,435	29.14	366	193,680	23.06	35,722	1,515	902,005	34,207
Sept.	41,311	22,317,275	24.12	.....	.....	..	425	219,849	23.09	.....	145	81,481	.....
Oct.	45,523	24,745,403	24.27	672	438,938	29.15	691	377,319	24.38	46,886	649	613,424	46,237
Nov.	58,756	30,648,620	23.29	130	85,363	29.24	379	200,270	23.58	59,265	60	29,800	59,205
Dec.	44,159	23,810,760	23.87	2,005	1,501,336	33.43	494	265,679	24.02	46,658	17	20,625	46,641
1947:													
Jan.	92,459	51,035,472	24.64	.....	.....	....	315	169,081	23.65	.. ..	20	16,644	.....
Feb.	57,771	30,580,942	23.63	2,426	1,550,499	28.52	481	256,760	23.84	60,678	1,991	1,149,953	58,687
Mar.	35,128	19,421,550	24.46	496	324,103	29.15	463	246,573	23.76	36,087	39	23,592	36,048
Apr.	45,453	23,627,600	23.21	34	26,754	34.84	524	282,941	24.09	46,011	26	20,725	45,985
May	91,918	47,208,658	22.93	763	442,050	25.87	345	186,201	24.11	93,026	14	9,169	93,012
June	62,346	28,339,739	20.29	2,825	1,642,417	25.95	554	298,705	24.07	65,725	47	22,998	65,678
July	56,080	22,379,698	17.08	1,407	855,454	25.09	74	27,458	16.55	57,561	421	226,777	57,140
Aug.	43,637	16,127,766	16.93	1,784	960,877	24.48	104	24,768	18.54	45,525	191	118,666	45,334
Sept.	45,724	14,589,611	14.24	516	324,206	27.12	44	10,414	15.29	46,284	174	95,640	46,110
Oct.	46,898	14,819,306	13.11	3,081	1,370,242	19.85	....	.....	....	49,979	134	54,620	49,665
Nov.	48,952	16,962,935	15.46	1,994	1,042,644	23.13	....	.....	....	50,946	514	289,752	50,432
Dec.	69,158	24,458,323	15.21	2,438	1,280,834	23.45	....	.....	....	71,596	371	215,958	71,225
1948:													
Jan.	76,723	29,782,199	17.33	4,130	2,044,850	22.11	....	.....	....	117,906	334	206,103	117,572
Feb.	51,528	21,027,604	18.06	2,400	1,420,676	26.43	43	10,235	10.53	53,971	290	170,339	53,681

Source: U. S. Department of Commerce.
Notes: (1) Figures for latex are on a dry weight basis. (2) Figures for re-exports include natural rubber (dry and latex) and guayule.

Natural Rubber
(Including Latex and Guayule)
(All Quantities in Long Tons)

Year	New Supply	Consumption	Re-Exports	Stocks On Hand at End of Period
1936	488,145	575,000	12,581	223,000
1937	600,479	543,600	7,902	262,204
1938	411,983	437,031	5,652	231,500
1939	499,473	592,000	13,125	125,800
1940	818,243	648,500	7,060	288,864
1941	1,029,007	775,000	5,376	533,344
1942	282,653	376,791	10,856	422,714
1943	55,329	317,634	20,815	139,594
1944	107,834	144,113	9,665	93,650
1945	135,672	105,429	6,743	118,715
1946	400,687	277,597	4,338	237,467
1947	688,354	562,661	4,101	129,038
1946:				
July	14,942	21,998	222	169,490
Aug.	45,087	28,405	592	185,580
Sept.	46,122	31,123	988	199,591
Oct.	36,735	35,421	106	200,799
Nov.	55,231	37,223	35	218,672
Dec.	57,620	38,802	23	237,467
1947:				
Jan.	102,080	45,328	43	294,191
Feb.	30,318	40,983	1,253	283,479
Mar.	40,437	43,104	509	280,812
Apr.	55,976	43,818	0	292,970
May	2,738	43,018	0	330,960
June	57,055	42,529	311	345,175
July	57,243	40,389	421	131,624
Aug.	44,672	47,289	191	130,040
Sept.	46,241	50,557	174	122,097
Oct.	49,340	57,286	314	114,115
Nov.	50,840	52,076	514	110,752
Dec.	71,414	56,284	371	129,038
1948:				
Jan.	80,564	58,174	334	136,227
Feb.	54,418	51,012	290	148,081
Mar.	72,070	54,230	467	130,217

Source: 1936-40, U. S. Department of Commerce; 1941 to date, Rubber Division, OMD, and Predecessor Agencies.

U.S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.
(All Quantities in Long Tons)

	Balata		Jelutong		Gutta-Percha & Other Guttas	
Year	Tons	Value	Tons	Value	Tons	Value
1936	535	199,368	6,163	1,296,364	1,568	555,643
1937	354	151,344	7,109	2,017,786	1,122	440,894
1938	509	181,140	9,132	2,944,504	444	204,582
1939	694	265,553	6,640	1,603,418	1,740	539,255
1940	648	300,500	7,451	2,449,137	2,340	1,004,885
1941	924	489,514	8,821	2,954,001	1,783	607,025
1942	1,544	1,107,059	1,200	530,296	804	525,763
1943	1,047	708,701	35	14,840	....	.....
1944	1,012	660,805	88	45,578	10	4,999
1945	1,361	907,253	....	.....	36	21,970
1946	2,281	2,233,065	304	256,169	423	458,064
1947	1,982	2,276,531	2,878	1,496,887	392	779,591
1946:						
May	325	212,899	....	.....	....	.....
June	80	80,006	....	.....	..	.....
July	219	178,564	115	91,412	7	19,839
Aug.	234	249,380	....	.....	4	13,438
Sept.	159	161,937	4	9,337	23	47,147
Oct.	282	367,393	21	29,307	305	216,901
Nov.	152	270,379	28	39,502	3	10,233
Dec.	199	287,167	57	41,757	26	52,096
1947:						
Jan.	183	252,580	37	29,087	36	71,252
Feb.	270	300,828	36	44,629	17	39,679
Mar.	137	158,530	190	112,132	21	28,898
Apr.	85	106,783	178	86,923	31	48,178
May	212	208,440	524	259,745	86	164,611
June	76	63,612	83	37,314	17	88,420
July	19	24,444	287	122,677	22	50,204
Aug.	151	159,338	143	78,357	19	46,667
Sept.	86	120,633	408	192,352	18	120,633
Oct.	210	389,245	352	187,255	35	88,776
Nov.	290	302,164	148	106,443	15	53,202
Dec.	172	189,934	412	240,023	42	77,371
1948:						
Jan.	56	35,973	481	289,506	69	94,854

Source: U. S. Department of Commerce.

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Synthetic Rubber—Totals

(GR-S, Neoprene, Butyl, and Buna N Types)

(All Quantities in Long Tons)

Year	Production	Imports	Consumption	Exports	Stocks On Hand at End of Period
1941	8,383	.....	6,259	572	1,702
1942	22,434	.....	17,651	1,419	4,612
1943	231,722	.....	170,891	18,148	41,568
1944	762,630	11,043	566,670	104,266	142,927
1945	820,373	10,407	693,580	83,778	203,454
1946	740,026	7,709	761,699*	72,920	114,963
1947	508,702	1,093	559,566	11,385	62,366
1947:					
Jan.	62,103	0	58,764	3,359	115,655
Feb.	59,125	0	53,321	2,166	119,912
Mar.	57,478	0	55,514	704	121,322
Apr.	50,117	4	54,333	357	116,829
May	39,069	0	48,692	433	105,291
June	35,681	0	42,580	2,286	97,612
July	31,917	0	37,607	412	97,728
Aug.	32,901	0	39,001	585	91,288
Sept.	30,518	0	41,865	343	79,246
Oct.	33,834	0	45,668	194	67,379
Nov.	37,825	634	39,091	188	67,871
Dec.	38,134	455	43,230	358	62,366
1948:					
Jan.	39,428	1,121	43,003	416	60,290
Feb.	39,025	1,318	35,375	428	65,649
Mar.	43,940	1,769	38,129	383	72,776

Source: Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures shown include the output of both government and privately-owned plants. (3) Figures for 1941 are estimated. * Includes year-end adjustment of 5,384 tons to cover non-reporting companies.

Synthetic Rubber—By Type

(All Quantities in Long Tons)

New Supply

	GR-S (Buna S)	GR-M (Neoprene)	GR-I (Butyl)	Buna N Types	Total
1942	3,721	8,956	23	9,734	22,434
1943	182,259	33,603	1,373	14,487	231,722
1944	679,949	56,660	20,252	16,812	773,673
1945	724,859	45,672	52,378	7,871	830,780
1946	613,408	47,766	80.823	5,738	747,735
1947	408,858	31,495	62,824	6,618	509,795

Consumption

1942	2,579	6,833	22	8,217	17,651
1943	131,977	26,205	304	12,405	170,891
1944	495,552	46,243	10,763	14,112	566,670
1945	600,145	42,394	43,012	8,029	693,580
1946	632,126	44,357	79,228	5,988	761,699
1947	448,589	37,703	68,838	4,536	559,666

Exports

1942	222	1,037	....	160	1,419
1943	14,937	2,540	40	631	18,148
1944	98,380	4,799	530	557	104,266
1945	76,555	5,837	980	406	83,778
1946	68,763	2,642	495	1,020	72,920
1947	7,951	2,617	62	755	11,385

Stocks at End of Period

1942	1,050	1,786	4	1,772	4,612
1943	30,975	6,415	1,035	3,143	41,568
1944	116,130	11,739	9,892	5,166	142,927
1945	170,571	9,703	18,378	4,802	203,454
1946	81,483	10,470	19,478	3,532	114,963
1947	40,606	5,237	13,184	3,339	62,366

Source: Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures for GR-M and Buna N Types include production of privately-owned plants.

Gasoline Consumption

(In Thousands of Barrels of 42 Gallons)

	1941	1942	1943	1944	1945	1946	1947	1948
Jan.	46,190	49,216	36,085	47,540	52,008	51,746	57,057	61,308
Feb.	42,782	42,666	36,274	47,754	48,856	47,654	50,551	56,487
Mar.	49,572	50,820	41,586	52,263	55,364	56,703	59,947	.....
Apr.	55,879	49,554	48,177	50,005	59,024	62,111	64,140	.....
May	60,121	53,212	49,828	54,230	60,748	66,800	70,865	.....
June	59,062	50,077	52,325	54,266	60,580	63,247	71,329	.....
July	63,906	54,606	49,867	55,119	66,170	69,076	73,441	.....
Aug.	63,575	48,793	51,880	55,618	70,058	66,729	72,089	.....
Sept.	59,768	50,093	49,707	56,318	64,529	62,268	71,384	.....
Oct.	58,412	50,094	53,111	53,154	55,708	66,637	73,277	.....
Nov.	54,670	50,729	50,703	54,967	53,543	61,345	64,158	.....
Dec.	53,568	39,250	48,695	52,250	49,745	61,101	67,285	.....
Total	667,505	589,110	568,238	633,482	696,333	735,417	795,535	.....

Source: U. S. Bureau of Mines.

Reclaimed Rubber

(Including Natural and Synthetic)

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude [a]	Exports	Stocks On Hand at End of Period
1936	150,571	141,486	24.6	7,085	19,000
1937	185,033	162,000	29.8	13,233	28,800
1938	122,400	120,800	27.6	7,403	23,000
1939	186,000	170,000	28.7	12,611	25,250
1940	208,971	190,244	29.3	11,347	32,636
1941	274,202	251,231	32.2	13,851	41,750
1942	286,007[b]	254,820	64.6	30,405	42,532
1943	304,058[c]	291,082	59.6	15,678	46,201
1944	260,631[d]	251,083	35.3	11,800	43,832
1945	243,309	241,036	30.2	13,413	28,155
1946	295,612	275,410	26.5	14,461	33,666
1947	291,395	288,395	24.8	14,556	35,943
1946:					
Oct.	26,322	26,706	27.7	759	34,261
Nov.	24,748	24,385	25.6	1,108	33,516
Dec.	25,254	23,597	25.6	1,507	33,666
1947:					
Jan.	25,545	27,715	26.6	1,443	30,053
Feb.	23,990	25,484	27.3	1,142	27,417
Mar.	26,209	26,157	26.8	1,268	31,940
Apr.	26,696	25,066	25.5	1,073	33,527
May	25,408	21,908	23.1	1,271	37,145
June	24,144	21,283	25.0	1,200	39,598
July	21,252	20,433	26.8	1,052	39,704
Aug.	21,658	21,093	24.4	1,414	40,130
Sept.	22,561	23,801	25.6	902	38,461
Oct.	25,648	26,735	26.3	1,016	36,643
Nov.	23,145	23,425	25.7	1,339	36,347
Dec.	25,123	25,229	25.4	1,437	35,943
1948:					
Jan.	25,634	25,885	25.5	768	36,307
Feb.	23,678	22,374	25.9	1,273	38,444
Mar.	24,083	24,719	26.8	937	38,657

Source: 1936-40, Department of Commerce; 1941 to date, Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. [a] Includes natural and synthetic rubber. [b] Includes 893 tons of imports. [c] Includes 67 tons of imports. [d] Includes 21 tons of imports.

Automobile Production in U. S.

(Civilian Production Only)

Year	Passenger Cars	Trucks	Total	Year	Passenger Cars	Trucks	Total
1930	2,784,745	571,241	3,355,986	1939	2,866,796	704,308	3,571,104
1931	1,973,090	416,648	2,389,738	1940	3,692,328	721,637	4,413,965
1932	1,135,491	235,187	1,370,678	1941	3,744,500	875,381	4,619,681
1933	1,573,512	346,545	1,920,057	1942	220,814	133,083	353,897
1934	2,177,919	575,192	2,753,111	1943	0	4,501	4,501
1935	3,252,244	694,690	3,946,934	1944	0	124,819	124,819
1936	3,669,528	781,862	4,451,390	1945	83,792	313,643	397,435
1937	3,915,889	892,382	4,808,271	1946	2,148,699	930,760	3,079,459
1938	2,000,985	485,852	2,486,837	1947	3,558,178	1,220,634	4,778,812
1947:							
Jan.	246,605	99,818	346,423	July	279,631	97,814	377,445
Feb.	267,015	105,042	372,057	Aug.	261,158	86,509	347,667
Mar.	301,525	118,234	419,759	Sept.	307,942	110,720	418,662
Apr.	314,765	106,984	421,749	Oct.	315,969	118,365	434,334
May	284,357	96,430	380,787	Nov.	305,148	87,611	392,759
June	307,124	91,810	398,934	Dec.	366,939	101,569	468,508
1948:							
Jan.	305,081	99,200	404,281	July	.....	.....	.....
Feb.	274,847	107,054	381,901	Aug.	.....	.....	.....
Mar.	349,998	140,606	490,604	Sept.	.....	.....	.....
Apr.	.....	.....	.....	Oct.	.....	.....	.....
May	.....	.....	.....	Nov.	.....	.....	.....
June	.....	.....	.....	Dec.	.....	.....	.....

Source: Automobile Manufacturers Association.
Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

Rim Production

	1943	1944	1945	1946	1947
Passenger Car	780,291	1,748,917	4,504,368	15,058,469	21,346,004
Truck & Bus	4,949,004	6,391,441	6,486,652	5,939,244	7,737,353
Agricultural	301,997	997,301	1,441,909	1,735,992	2,633,699
Earth Mover	945	703	1,308	5,520	10,610
Total	6,032,237	9,138,362	12,434,237	22,739,225	31,727,666

	1947 Oct.	1947 Nov.	1947 Dec.	1948 Jan.	1948 Feb.	1948 Mar.
Passenger Car	2,225,026	1,771,961	1,967,503	2,032,210	1,683,295	2,003,878
Truck & Bus	725,182	521,230	651,273	584,095	601,940	759,794
Agricultural	236,717	228,308	266,690	231,049	196,894	335,565
Earth Mover	1,730	1,210	586	1,710	1,479	1,336
Total	3,188,655	2,522,709	2,886,052	2,849,064	2,483,608	3,100,573

Source: The Tire & Rim Association, Inc.

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(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1935 (total)	19,263	29,406	1,514	50,183	49,362	8,196
Passenger Car.	17,063	26,036	948	44,047	43,256	7,054
Truck and Bus	2,200	3,370	566	6,136	6,106	1,142
1936 (total)	21,446	30,866	1,073	53,385	56,041	10,717
Passenger Car.	18,941	26,999	644	46,584	49,013	9,291
Truck and Bus	2,505	3,867	429	6,801	7,028	1,426
1937 (total)	22,353	29,886	1,246	53,485	53,310	10,383
Passenger Car.	20,055	26,177	696	46,928	46,497	8,745
Truck and Bus	2,298	3,709	550	6,557	6,813	1,638
1938 (total)	11,516	30,567	1,049	43,132	40,907	8,451
Passenger Car.	10,086	27,104	580	37,770	35,789	6,937
Truck and Bus	1,430	3,463	469	5,362	5,118	1,514
1939 (total)	18,208	38,022	1,279	57,509	57,613	8,665
Passenger Car.	15,742	33,471	607	49,820	49,933	7,108
Truck and Bus	2,466	4,551	672	7,689	7,680	1,557
1940 (total)	22,252	35,346	1,176	58,774	59,186	9,127
Passenger Car.	19,560	30,903	411	50,874	50,965	7,270
Truck and Bus	2,692	4,443	765	7,900	8,221	1,857
1941 (total)	24,780	39,895	1,489	66,164	61,540	4,436
Passenger Car.	19,855	34,119	586	54,560	50,392	3,165
Truck and Bus	4,925	5,776	903	11,604	11,148	1,271
1942 (total)	6,680	8,872	207	15,759	15,351	6,247
Passenger Car.	910	2,734	38	3,682	2,790	4,432
Truck and Bus	5,770	6,138	169	12,077	12,561	1,815
1943 (total)	6,128	18,547	225	24,900	20,423	1,883
Passenger Car.	82	10,606	71	10,759	7,620	1,132
Truck and Bus	6,046	7,941	154	14,141	12,803	751
1944 (total)	6,654	26,439	263	33,356	33,446	2,013
Passenger Car.	208	18,330	130	18,668	18,819	1,218
Truck and Bus	6,446	8,109	133	14,688	14,627	795
1945 (total)	5,984	36,479	504	42,967	44,524	3,077
Passenger Car.	1,115	25,463	222	26,800	28,200	2,214
Truck and Bus	4,869	11,016	282	16,167	16,324	863
1946 (total)	15,310	65,490	1,512	82,312	82,298	2,448
Passenger Car.	11,086	54,684	653	66,423	66,466	1,763
Truck and Bus	4,224	10,806	859	15,889	15,832	685
1947 (total)	25,055	62,890	3,249	91,194	95,548	6,975
Passenger Car.	19,644	52,865	1,608	74,117	77,790	5,470
Truck and Bus	5,411	10,025	1,642	17,077	17,758	1,505
1947:						
Dec. (total) ...	2,338	4,029	216	6,583	8,050	6,975
Passenger Car.	1,919	3,326	91	5,336	6,622	5,470
Truck and Bus	419	703	125	1,246	1,427	1,505
1948:						
Jan. (total)	2,340	3,433	157	5,919	7,851	8,806
Passenger Car.	1,865	2,805	67	4,737	6,439	7,074
Truck and Bus	465	628	90	1,182	1,412	1,731
Feb. (total)	2,020	2,887	200	5,106	6,385	10,172
Passenger Car.	1,578	2,351	88	4,017	5,110	8,231
Truck and Bus	442	536	111	1,090	1,276	1,941

Source: The Rubber Manufacturers Association, Inc.

Cotton, Rayon and Nylon Tire Fabrics

(Production in Thousands of Pounds)

	Cotton				Rayon and Nylon [b]		
	Tire Cord Not Woven	Cord Fabric Woven	Chafer and All Other Tire Fabrics	Total	Tire Cord Not Woven	Tire Cord And Other Tire Fabrics	Total
1944:							
Jan.-Mar.	17,135	42,783	11,452	71,370	1,812	15,830	17,642
Apr.-June	17,587	40,580	11,499	69,666	1,353	19,586	20,939
July-Sept.	16,653	38,462	11,055	66,170	1,299	25,915	27,214
Oct.-Dec.	12,982	34,107	10,948	58,037	2,773	33,630	36,403
Total	64,357	155,932	44,954	265,243	7,237	94,961	102,198
1945:							
Jan.-Mar.	16,671	43,835	12,306	72,812	3,726	37,777	41,503
Apr.-June	16,044	42,383	13,604	72,031	4,064	42,476	46,540
July-Sept.	15,136	38,158	14,122	67,416	3,549	42,606	46,155
Oct.-Dec.	15,514	36,442	13,573	65,529	a	47,734	47,734
Total	63,365	160,818	53,605	277,788	11,339	170,593	181,932
1946:							
Jan.-Mar.	17,128	39,377	15,245	71,750	a	51,208	51,208
Apr.-June	19,622	40,197	18,623	78,442	a	52,511	52,511
July-Sept.	17,279	39,259	18,787	75,325	5,102	46,932	52,034
Oct.-Dec.	20,660	42,668	21,708	85,036	5,858	50,589	56,447
Total	74,689	161,501	74,363	310,553	10,960	201,240	212,200
1947:							
Jan.-Mar.	21,972	49,377	21,815	93,164	5,322	52,059	57,381
Apr.-June	23,491	53,746	16,480	93,717	5,486	47,360	52,846
July-Sept.	15,571	44,291	14,596	74,458	6,161	51,719	57,880
Oct.-Dec.	18,183	48,532	17,762	84,477	6,550	55,078	61,628
Total	79,217	195,946	70,653	345,816	23,519	206,216	229,735

Source: U. S. Bureau of the Census.

Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics.

Automotive Inner Tubes

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1936	21,514	32,188	721	54,423	57,036	10,945
1937	22,464	29,554	749	52,767	52,373	10,312
1938	11,515	28,134	644	40,293	37,848	8,166
1939	18,190	31,998	1,002	51,190	50,649	7,036
1940	22,172	29,070	972	52,214	52,237	7,017
1941	24,722	33,749	1,232	59,703	57,433	4,686
1942	n.a.	n.a.	n.a.	13,958	12,568	5,742
1943	6,183	12,373	176	18,732	15,260	2,584
1944	6,461	19,739	190	26,390	26,750	2,823
1945	6,119	33,161	408	39,688	41,102	3,671
1946	15,327	59,357	1,424	76,108	77,251	3,820
1947	25,039	49,107	2,496	76,641	75,509	8,089
1947:						
Sept.	2,119	4,930	184	7,233	6,550	6,339
Oct.	2,187	5,278	150	7,616	7,619	6,424
Nov.	2,092	4,124	126	6,343	6,456	6,682
Dec.	2,334	2,873	117	5,324	6,544	8,089
1948:						
Jan.	2,327	2,745	81	5,152	6,226	9,116
Feb.	2,019	2,382	104	4,505	4,980	9,657

Source: The Rubber Manufacturers Association, Inc.
n.a.—Not available.

Smoked Sheets—Spot Closing Prices

(New York Market—Cents per pound)

Year	High	Low	Avg.	Year	High	Low	Avg.
1910	288	141	206.60	1929	26⅞	15½	20.55
1911	184	114	141.30	1930	16½	7½	11.98
1912	140	108	121.60	1931	8⅝	4¼	6.17
1913	113	59	82.04	1932	4¾	2½	3.49
1914	93	56	65.33	1933	9⅞	2¾	5.96
1915	79	58½	65.85	1934	15⅞	8¾	12.92
1916	102	55	72.50	1935	13¾	10½	12.37
1917	90	52	72.23	1936	23	13½	16.41
1918	70	40	60.15	1937	26⅞	14	19.39
1919	57	38½	48.70	1938	17⅞	10⅝	14.64
1920	56½	16	36.30	1939	24	14⅜	17.57
1921	21⅛	11½	16.36	1940	24	18¼	20.10
1922	28⅜	13⅝	17.50	1941	24⅞	19⅛	22.40
1923	37⅛	24¾	29.45	1942	22½	22½	22.50
1924	40⅛	17⅝	26.20	1943	22½	22½	22.50
1925	121	34⅜	72.46	1944	22½	22½	22.50
1926	88½	36¾	48.50	1945	22½	22½	22.50
1927	41¾	33	37.72	1946	22½	22½	22.50
1928	41¾	17	22.48	1947	25	14	20.00

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses. Free trading was resumed May 1, 1947.

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market—in Cents)

Average Monthly Price Per Pound

	1941	1942	1943	1944	1945	1946	1947	1948
Jan.	10.66	19.85	21.34	20.76	22.36	25.49	32.58	36.09
Feb.	10.87	20.05	21.61	21.34	22.29	26.57	33.91	33.63
Mar.	11.08	20.42	21.98	21.65	22.43	27.52	35.89	35.04
Apr.	11.48	21.10	22.02	21.71	21.88	28.40	35.89	38.10
May	12.97	20.88	21.97	21.63	23.30	28.17	36.51	....
June	14.66	19.78	21.92	22.31	23.42	29.89	37.83	....
July	16.55	20.27	21.46	22.33	23.27	34.11	38.03	....
Aug.	17.06	19.45	21.09	22.11	23.10	36.31	34.83	....
Sept.	17.94	19.62	21.10	22.10	23.25	37.59	32.21	....
Oct.	17.31	19.79	21.00	22.32	23.85	36.79	32.39	....
Nov.	17.21	20.21	20.32	22.13	24.71	31.50	34.50	....
Dec.	18.09	20.55	20.32	22.28	25.21	33.03	36.74	....
Average for Year	14.66	20.16	21.34	21.89	23.25	31.28	35.11	....

Consumption of Vinyl Resins

(In Thousands of Pounds)

	Sheeting and Film [a]	Textile and Paper Coating Resins [b]	Molding and Extrusion Materials [b]	All Other [b, c]
1946	52,080	11,673	61,852	27,083
1947	66,430	17,237	73,114	27,064
1947:				
July	3,722	1,537	4,567	1,747
Aug.	4,105	1,650	4,826	2,336
Sept.	5,790	1,194	5,788	2,354
Oct.	5,965	1,781	7,671	2,623
Nov.	7,246	1,680	5,760	2,155
Dec.	8,094	2,183	7,829	2,298
1948:				
Jan.	7,785	2,414	7,823	1,531
Feb.	5,980	2,102	7,601	1,951

Source: Bureau of the Census.

Notes: (a) Includes weight of fillers, plasticizers, extenders and safety glass sheeting; (b) Resin content; (c) Includes Adhesives, but excludes data for protective coating resins.

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Rubber Industry Employment, Payrolls, Wages and Hours

Employment — Thousands of Production Workers and Index (1939 = 100)

	1947				1948			
	All Rubber Products		Rubber Tires & Tubes		All Rubber Products		Rubber Tires & Tubes	
Month	Number	Index	Number	Index	Number	Index	Number	Index
Jan.	240	198.8	110	235.5	223	184.2	114	209.2
Feb.	240	198.2	109	233.3	218	180.3	...	....
Mar.	238	196.5	108	231.4	...	....	...	....
Apr.	234	193.5	106	227.0	...	....	...	....
May	223	184.5	102	220.0	...	....	...	....
June	219	180.7	118	217.0	...	....	...	....
July	212	175.2	115	212.3	...	....	...	....
Aug.	215	177.8	117	214.9	...	....	...	....
Sept.	215	178.1	113	207.5	...	....	...	....
Oct.	220	182.0	114	211.0	...	....	...	....
Nov.	223	184.5	115	212.2	...	....	...	....
Dec.	225	186.1	115	211.7	...	....	...	....

Payrolls — Production Workers Pay Rolls Unadjusted Index (1939 = 100)

	1946		1947		1948	
Month	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes
Jan.	290.1	272.6	386.3	416.3	376.8	388.4
Feb.	292.1	271.9	385.0	413.3	....	....
Mar.	298.2	281.1	374.3	397.3	....	....
Apr.	319.7	312.9	383.9	414.2	....	....
May	322.1	314.2	367.2	399.3	....	....
June	331.4	318.3	361.9	396.1	....	....
July	321.4	304.3	352.7	389.5	....	....
Aug.	336.9	311.2	357.4	396.0	....	....
Sept.	363.9	348.9	369.0	397.9	....	....
Oct.	361.3	346.1	375.6	398.0	....	....
Nov.	377.4	360.3	383.3	407.5	....	....
Dec.	392.2	368.9	396.5	412.1	....	....

Wages — Average Weekly Earnings

	1946		1947		1948	
Month	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes
Jan.	$46.71	$50.29	$54.03	$59.78	$57.33	$62.72
Feb.	46.05	49.21	54.06	59.90	54.79	58.22
Mar.	46.46	49.72	52.97	58.05	....	....
Apr.	49.67	54.77	55.23	61.64	....	....
May	49.82	54.72	55.30	61.12	....	....
June	50.45	54.82	55.49	61.35	....	....
July	50.60	56.11	55.74	62.06	....	....
Aug.	51.03	55.42	55.92	61.15	....	....
Sept.	53.69	59.89	57.76	64.75	....	....
Oct.	51.74	57.38	57.62	63.78	....	....
Nov.	52.93	58.87	57.99	64.86	....	....
Dec.	54.63	60.46	59.47	65.74	....	....

Wages — Average Hourly Earnings

	1946		1947		1948	
Month	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes
Jan.	$1.121	$1.255	$1.330	$1.511	$1.444	$1.646
Feb.	1.129	1.266	1.331	1.517	1.426	1.626
Mar.	1.138	1.275	1.330	1.512	....	....
Apr.	1.232	1.414	1.397	1.608	....	....
May	1.266	1.446	1.416	1.622	....	....
June	1.283	1.461	1.419	1.615	....	....
July	1.292	1.472	1.445	1.640	....	....
Aug.	1.295	1.474	1.445	1.640	....	....
Sept.	1.323	1.507	1.447	1.661	....	....
Oct.	1.313	1.492	1.436	1.644	....	....
Nov.	1.322	1.503	1.453	1.661	....	....
Dec.	1.331	1.513	1.454	1.658	....	....

Hours — Average Weekly Hours per Worker

Month	1946	1947	1948	Month	1946	1947	1948
January	41.7	40.6	39.7	July	39.2	38.6	...
February	40.8	40.6	38.4	August	39.4	38.7	...
March	40.8	39.8	...	September	40.6	39.9	...
April	40.3	39.5	...	October	39.4	40.1	...
May	39.4	39.0	...	November	40.1	39.9	...
June	39.3	39.1	...	December	41.2	40.9	...

Source: U. S. Department of Commerce.

Indexes of Production, Shipments and Inventory For The Rubber Industry

Production 1935-1939 = 100 (Based on man-hours)

Month	1946	1947	1948	Month	1946	1947	1948
Jan.	215	247	223	July	211	207	....
Feb.	216	246	215	Aug.	221	210	....
Mar.	221	239	....	Sept.	234	217	....
Apr.	219	234	....	Oct.	234	223	....
May	215	220	....	Nov.	243	225	....
June	218	216	....	Dec.	252	230	....

Shipments—Average Month 1939 = 100 (Based on $ Value)

Jan.	229	290	....	July	268	289	....
Feb.	248	315	....	Aug.	282	300	....
Mar.	260	322	....	Sept.	311	336	....
Apr.	282	311	....	Oct.	333	338	....
May	288	300	....	Nov.	313	345	....
June	293	312	....	Dec.	352	....	....

Inventory — Average Month 1939 = 100 (Based on $ Value)

Jan.	173.7	238.0	....	July	195.0	272	....
Feb.	179.9	250.0	....	Aug.	198.0	262	....
Mar.	186.4	262.0	....	Sept.	204.0	251	....
Apr.	198.5	273.0	....	Oct.	212.0	251	....
May	195.5	282.0	....	Nov.	215.0	247	....
June	192.4	281.0	....	Dec.	216.0	...	....

Source: U. S. Department of Commerce.

Various Compounding Materials Consumed by the Rubber Industry

Material	1940	1941	1942	1943	1944	1945	1946
Asphalt [a]							
Short tons	22,772	20,536	22,263	16,510	20,189	19,483	28,715
% of total	0.9	0.6	0.6	0.5	0.6	0.5	0.7
Barite (Barytes):							
Short tons	4,283	9,800	6,334	8,000	10,000	10,000	20,000
% of total	2.3	4.2	3.6	3.9	2.9	2.1	4.4
Carbon Black:							
Short tons	155,090	219,751	147,974	236,737	369,015	402,193	470,732
% of total	58.5	68.2	65.8	75.2	78.7	78.9	74.1
Clay, Kaolin:							
Short tons	92,640	127,055	51,334	50,964	59,588	109,936	162,393
% of total	11.1	11.6	5.1	5.5	6.8	11.7	12.3
Clay, Fire & Stoneware:							
Short tons	10,104	9,000	5,000	10,259	7,160	7,800	12,951
% of total	0.4	0.2	0.1	0.2	0.1	0.1	0.2
Lead Sulfate, Basic:							
Short tons	128	200	89	131	268	200	.....
% of total	2.1	1.9	1.1	2.3	4.2	5.2	.....
Lime:							
Short tons	1,879	3,058	1,381	2,039	5,634	7,170	3,193
% of total	0.03	0.05	0.02	0.05	0.13	0.16	0.1
Litharge:							
Short tons	1,590	3,968	3,460	4,302	3,023	1,864	2,131
% of total	1.8	3.3	3.8	3.8	2.2	1.3	1.6
Lithopone:							
Short tons	3,387	3,547	1,047	1,078	726	977	1,607
% of total	2.2	2.0	0.8	0.8	0.5	0.7	1.1
Mica, Ground:							
Short tons	1,731	3,476	1,754	3,063	1,137	3,715	4,951
% of total	6.2	8.0	3.7	6.0	2.2	7.0	8.0
Sulfur:							
Short tons	54,000	63,000	40,000	51,000	63,000	64,960	72,800
% of total	2.5	2.4	1.4	1.8	1.9	2.0	2.2
Talc [b]							
Short tons	28,501	58,114	40,487	48,994	51,833	63,758*	65,980
% of total	10.0	13.9	10.0	11.8	13.0	16.0	14.4
Zinc Oxide:							
Short tons	70,979	90,429	52,717	67,898	59,518	63,447	83,776
% of total	62.8	63.4	53.0	47.4	42.3	49.6	53.1

([b]) Includes pyrophyllite and ground soapstone. * Revised.

Source: U. S. Bureau of Mines.

Notes: ([a]) Solid and semi-solid products of less than 200 penetration.

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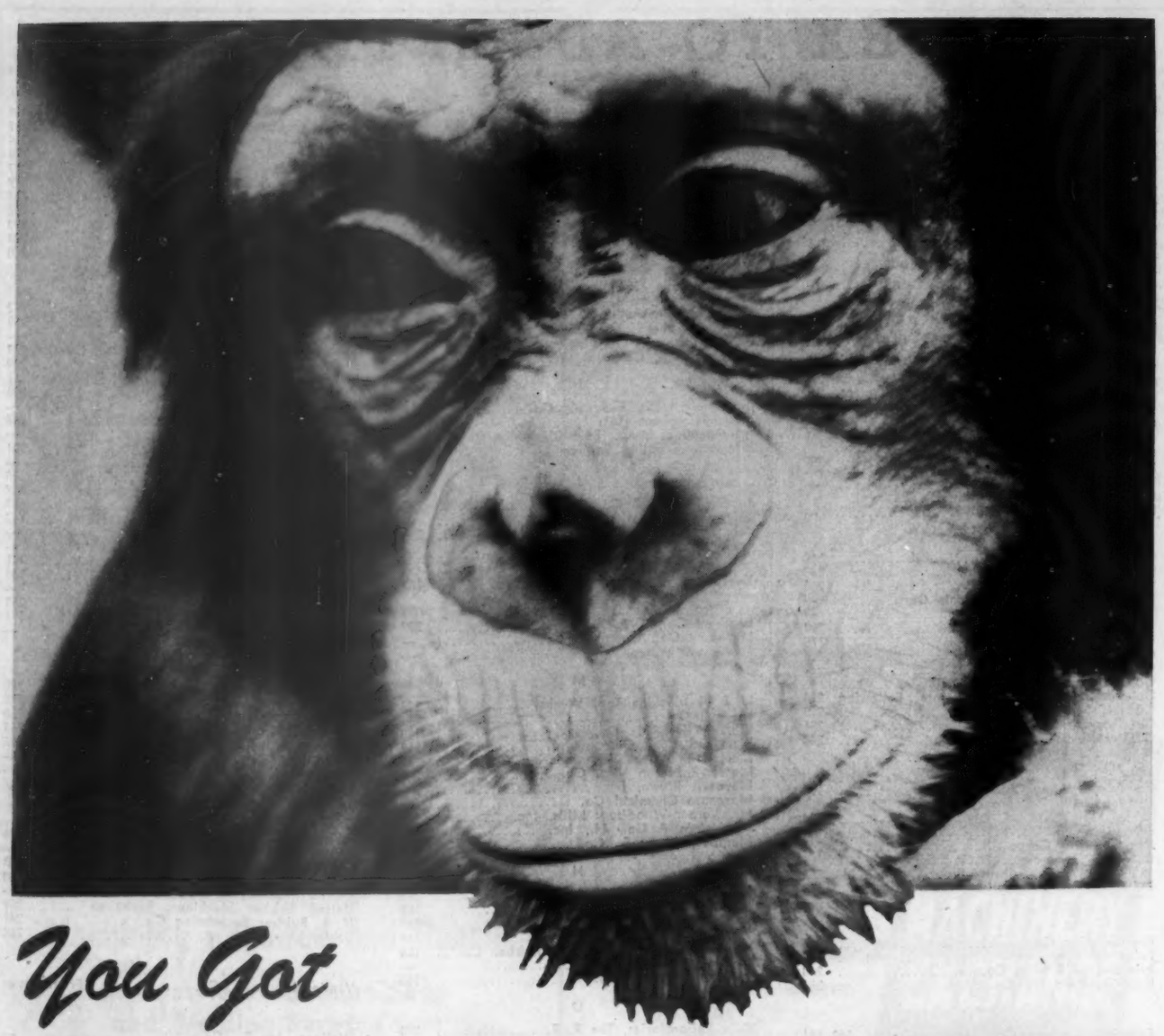

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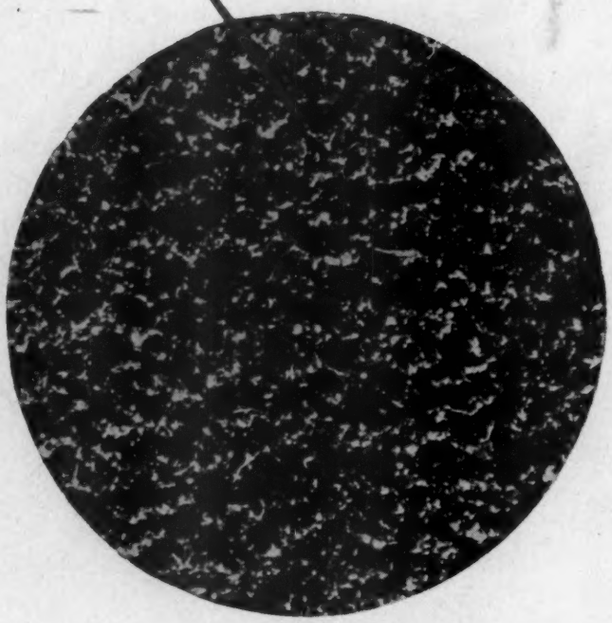

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TECHNOLOGY DEPARTMENT

TWO NEW PLASTICIZERS FOR VINYL RESINS

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DETROIT

New Hycar Nitrile Polymers make processing easier and widen fields for makers of many products

THIS news is important to any company dealing in any way with the vinyl resins. The new Hycar EP (easy processing) and Hycar NS (easy-processing, non-staining) offer exceptional advantages. These are nitrile rubbers that really *blend* with the vinyls. Check these properties:

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★ **EASY PROCESSING**—and a more perfect blend either on a mill or in a Banbury. Calenders and extrudes *smoothly*.

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★ **WIDER LATITUDE**—in color and color stability, particularly with those hard-to-do pastels.

Our service bulletin, 48-H1, on the use of the new Hycar American Rubber with the vinyl resins, will be sent on request. We make no finished products from Hycar or any of our other raw materials, but we are glad to help in the development work on any special applications. Write Dept. HB-6, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

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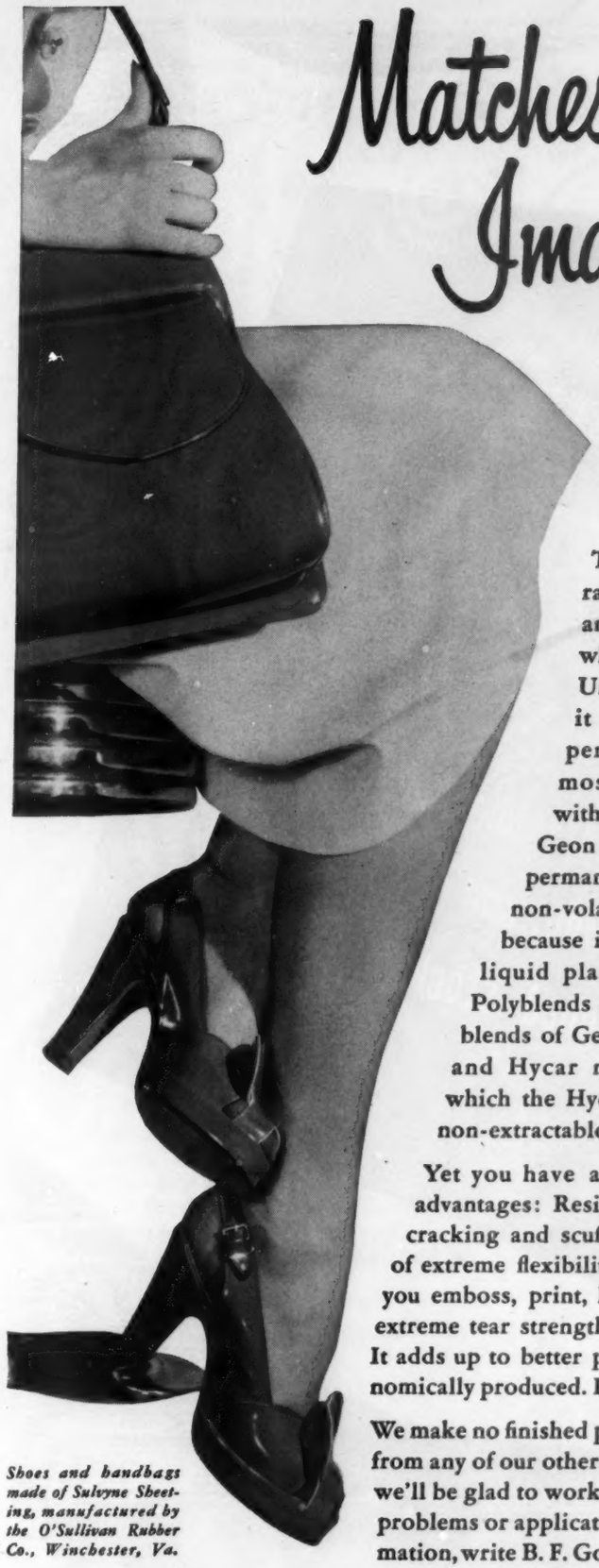

Shoes and handbags made of Sulvyne Sheeting, manufactured by the O'Sullivan Rubber Co., Winchester, Va.

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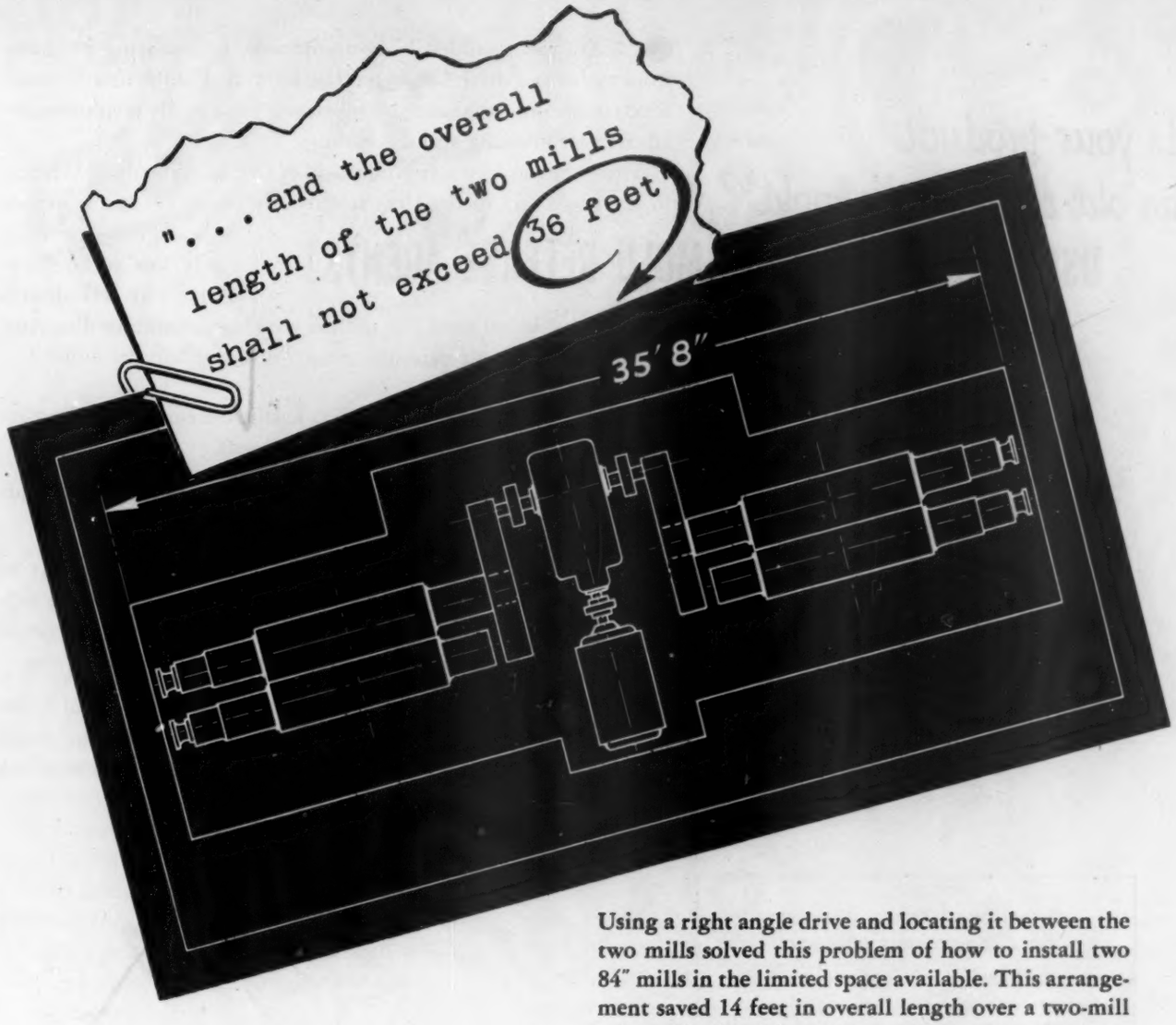

Using a right angle drive and locating it between the two mills solved this problem of how to install two 84" mills in the limited space available. This arrangement saved 14 feet in overall length over a two-mill unit with the drive and motor at one end or two mills with individual drive.

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FB-458

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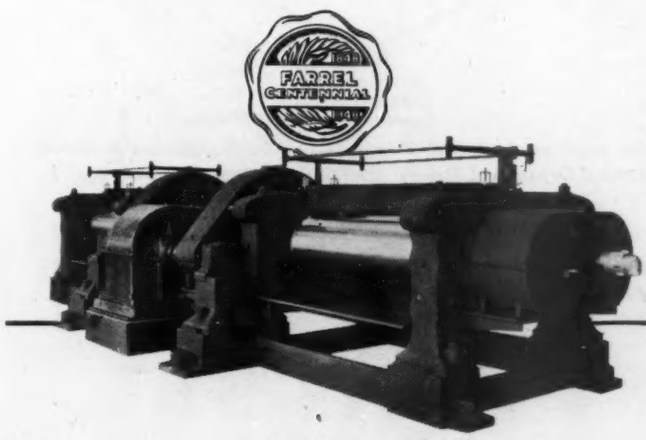

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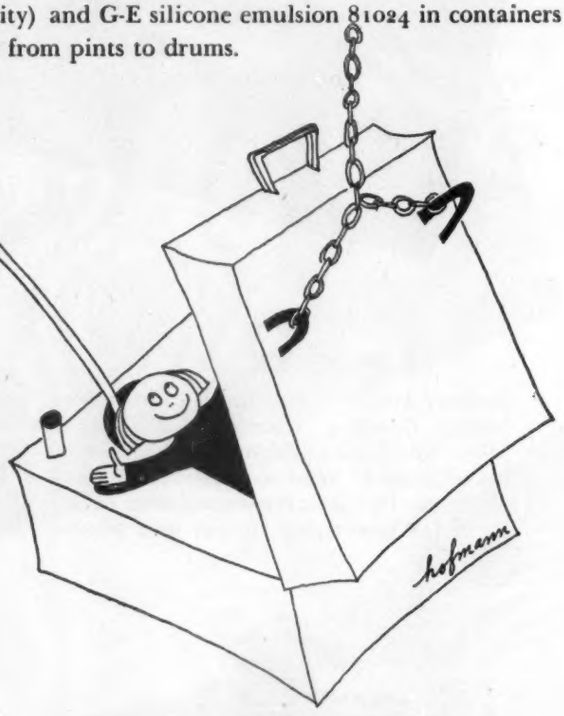

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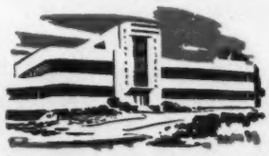

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4. Miscellaneous Reclaiming Processes
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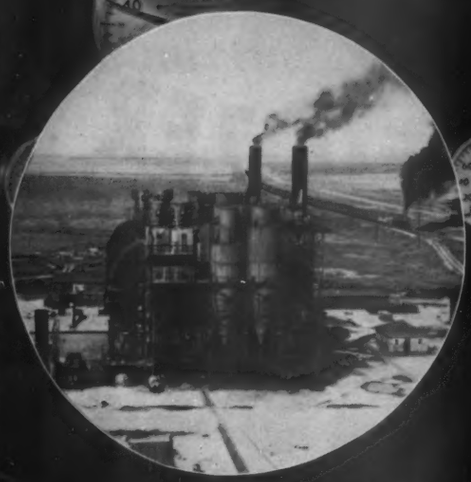

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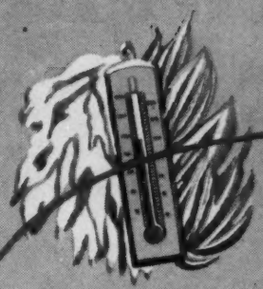

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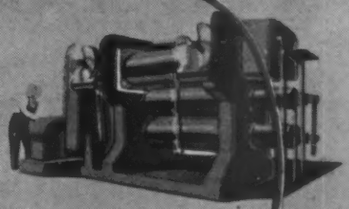

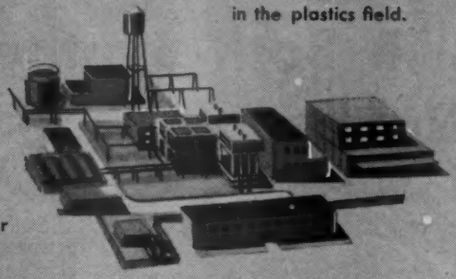

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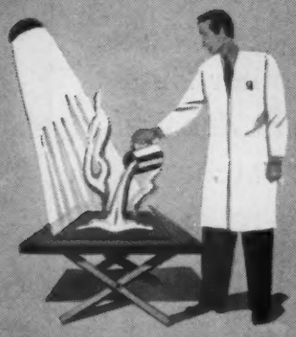

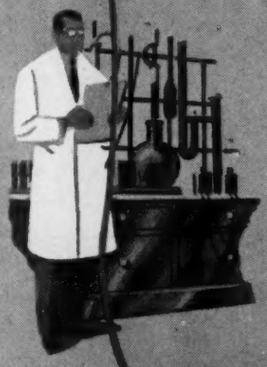

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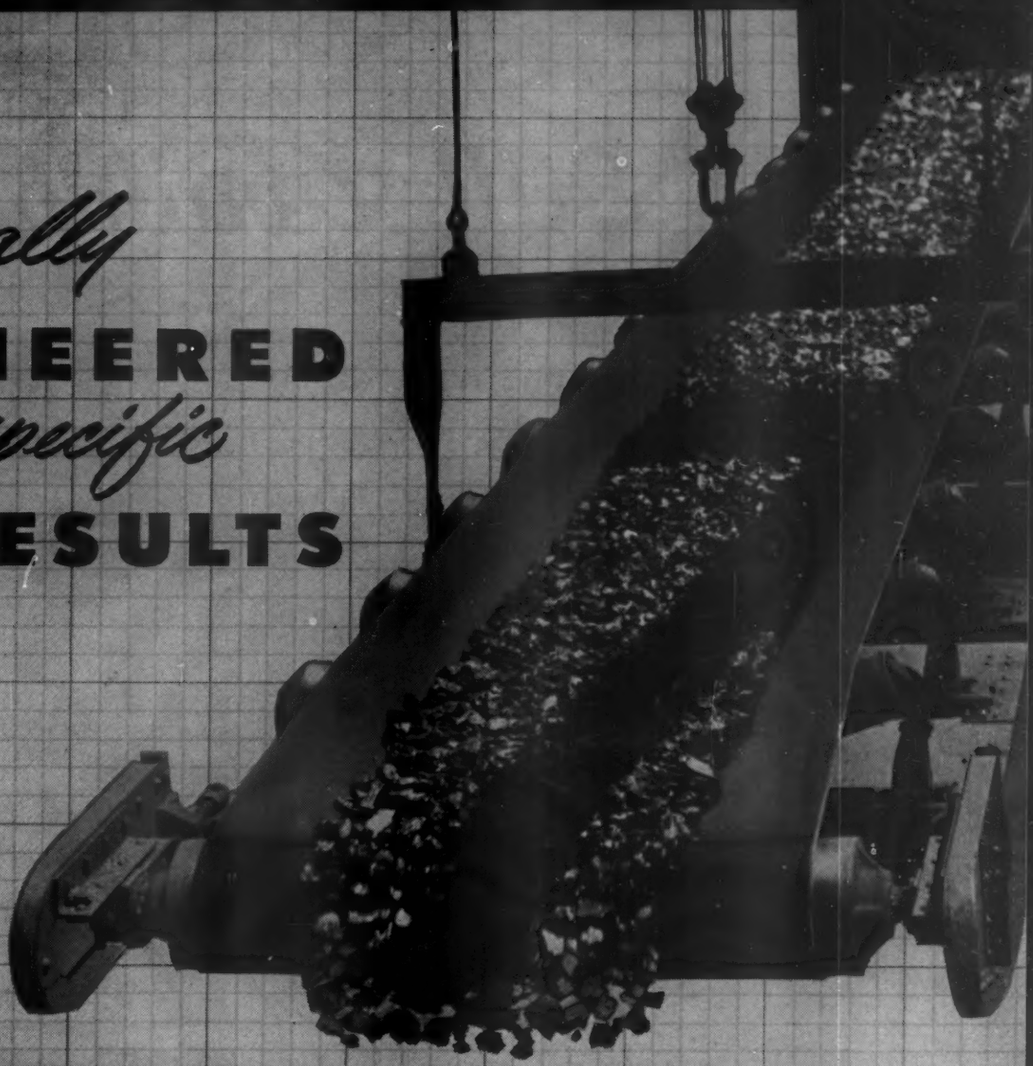

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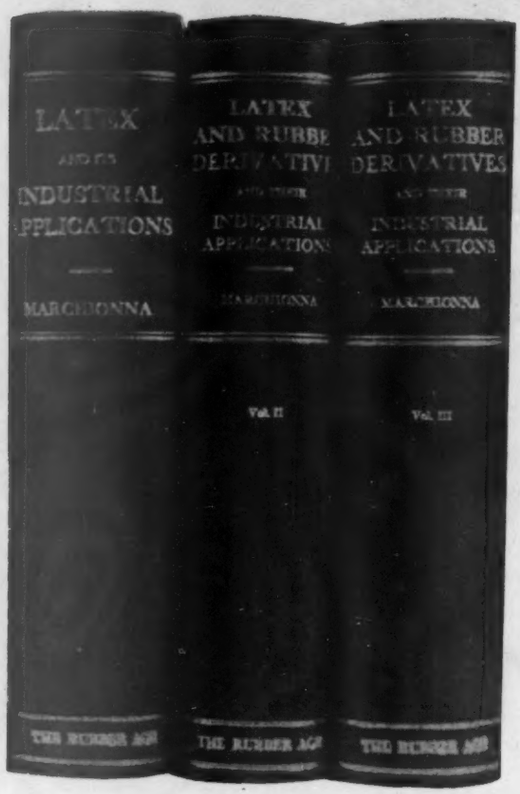

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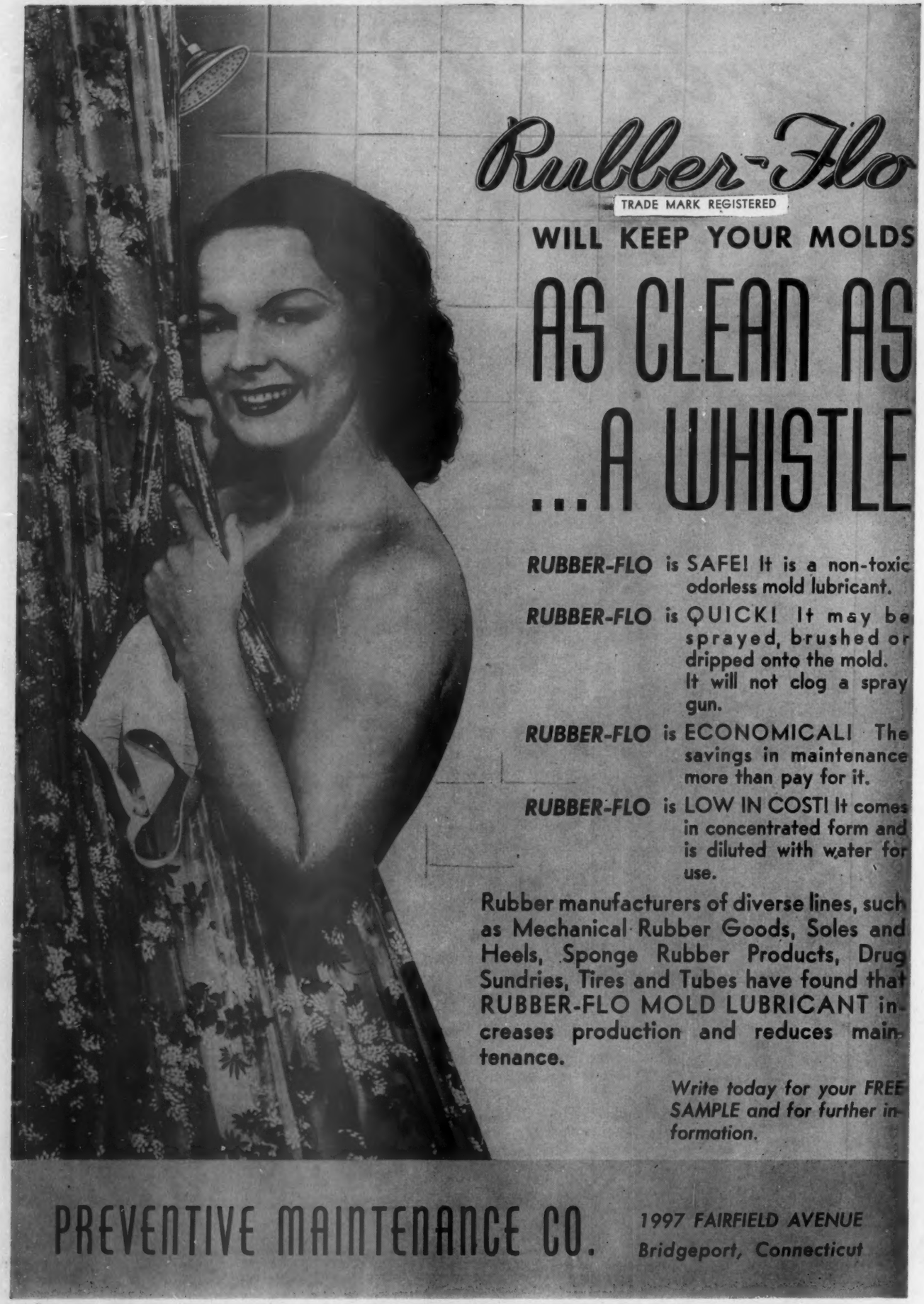
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RUBBER-FLO is ECONOMICAL! The savings in maintenance more than pay for it.
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Rubber manufacturers of diverse lines, such as Mechanical Rubber Goods, Soles and Heels, Sponge Rubber Products, Drug Sundries, Tires and Tubes have found that RUBBER-FLO MOLD LUBRICANT increases production and reduces maintenance.
Write today for your FREE SAMPLE and for further information.
PREVENTIVE MAINTENANCE CO.
1997 FAIRFIELD AVENUE
Bridgeport, Connecticut

available in quantity

SANTICIZER 160

Now available for immediate shipment in tank car lots, Santicizer 160 can be profitably used in a wide variety of processes. In addition to its value as a heat-stable plasticizer for vinyl sheetings, extrusions, tubings and floor tiles, Santicizer 160 has properties of interest to manufacturers of adhesives, nitrocellulose lacquers, printing inks and molding powders.

For detailed technical information, prices and samples of Santicizer 160, write, wire or phone MONSANTO CHEMICAL COMPANY, Plasticizers and Resins Department, 1700 South Second Street, St. Louis 4, Missouri (phone: Main 4000)... or get in touch with any District Sales Office. If more convenient, simply return the handy coupon.

PROCESSING ADVANTAGES OF SANTIZICER 160

1. **Compatible with a wide variety of resins.**
2. **Makes possible faster extrusion at temperatures normally employed — existing production rates can be maintained at lower temperatures.**
3. **Imparts low burning rate, oil resistance, heat stability, light stability, abrasion resistance and permanence.**

Santicizer: Reg. U. S. Pat. Off.

District Sales Offices: New York (Plaza 9-8200), Philadelphia (Locust 4-0247), Chicago (Whitehall 6750), Boston (Liberty 2-6440), Detroit (Trinity 2-5728), Cleveland (Superior 3830), Cincinnati (Dunbar 1414), Charlotte (2-3454), Birmingham (7-0877), Houston (Capitol 6542), Akron (Hemlock 6191), Los Angeles (Michigan 6048), San Francisco (Yukon 6-6232), Seattle (Main 4203), Portland (Beacon 6740). In Canada: Monsanto (Canada) Limited, Montreal (Market 4236).

MONSANTO
CHEMICALS AND PLASTICS

RAO-2

MONSANTO CHEMICAL COMPANY
Plasticizers and Resins Department
1700 South Second Street, St. Louis 4, Missouri

Send me immediately technical information and samples of Santicizer 160 for_____

Name_____ Title_____

Company_____

Address_____

City_____ State_____

SERVING INDUSTRY...WHICH SERVES MANKIND

GIANT farm-tractor or off-the-road-tire molds, engraved or of aluminum construction, present no problems to Bridgwater. Special machine tools, many of our own design and make, assure the same precise corners, the same accurate template fit to all characters and ribs in the design, the same highly polished surface characteristic of molds by Bridgwater.

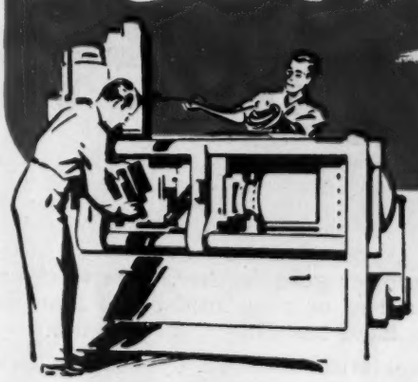
Our new Athens Machine Division, plus enlarged facilities at our Akron plant, enable us to produce quickly molds of any size or type — and at the lowest possible cost.

THE BRIDGWATER MACHINE COMPANY

Akron, Ohio

FOR BETTER MOLDS FOR BETTER TIRES *SPECIFY* BRIDGWATER

RELEASE MOLDED RUBBER *Economically*



USE COLITE CONCENTRATE... *A High Quality Concentrated Liquid Mold and Mandrel Lubricant*

- Results in a shiny, satin-like finish.
- Never builds up on the molds.
- Is extremely *economical.*
- Is non-toxic, non-tacky, odorless.

Write today for further information on the Colite Concentrate way of removing cured rubber and plastics from molds

For brighter white goods, **Colite D43D is recommended.**

THE BEACON COMPANY
PURITY · UNIFORMITY · DEPENDABILITY
Chemical Manufacturers
97 BICKFORD STREET · BOSTON, MASSACHUSETTS

In Canada: PRESCOTT & CO., REG'D., 774 ST. PAUL ST. W., MONTREAL

6 BIG ADVANTAGES..

make this attachment Indispensable!

..the Akron-Standard STOCK BLENDER

TIRE manufacturers testify, "Once used, never without". Handling labor is reduced. Operation is automatic until the milled stock is removed. Speed up your operation and enjoy more uniform stock production through these six features:

1. Manpower goes further. One workman can run two or more mills. No more laborious hand blending and warm-up.
2. Temperature reduced by passing compound or batch overhead. Cooler stocks permit adding accelerators without scorching.
3. Positive bank control with lower power consumption.
4. Correct milling time for every batch.
5. Less mixing time (or larger batches proportionately).
6. Uniform operation, uniform plasticity, uniform dispersion.

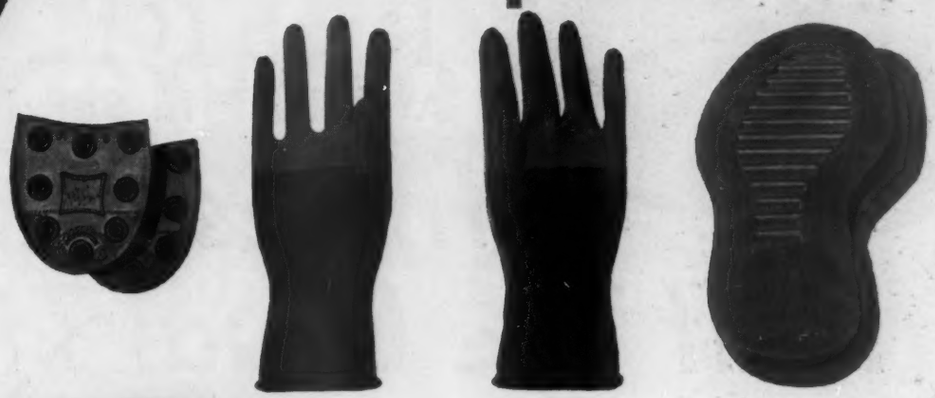
Ask for our 40-page Bulletin "A-6" describing this and many other profit-earning types of Akron-Standard equipment.

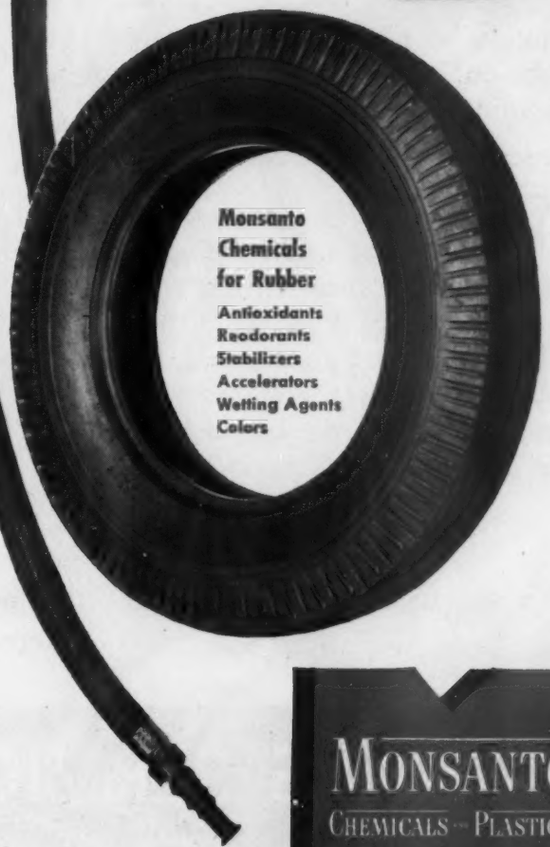
The Akron Standard Mold Co.

1624 Englewood Avenue — *"The Established Measure of Value"* — Akron 5, Ohio, U. S. A.

SANTOFLEX B

protects rubber stocks against oxidation and flex cracking





Monsanto Chemicals for Rubber

- Antioxidants
- Reodorants
- Stabilizers
- Accelerators
- Wetting Agents
- Colors

Santoflex B provides compounders with dependable protection against oxidation and flex cracking. This vital chemical action will insure superior qualities in a wide variety of finished products... including tires, tubes, hose, heels, soles, belts and many kinds of mechanical goods.

Santoflex B is widely specified by plant men because it melts and flows into rubber stocks—gives uniform dispersion at milling temperatures.

For complete information, prices and samples of Santoflex B or other Monsanto chemicals for better rubber products, write to MONSANTO CHEMICAL COMPANY, Rubber Service Department, Second National Building, Akron 8, Ohio. If more convenient, simply return the coupon.

Santoflex: Reg. U. S. Pat. Off.

MONSANTO
CHEMICALS — PLASTICS

MONSANTO CHEMICAL COMPANY RA-3
Rubber Service Department
Second National Building, Akron 8, Ohio
Please send me further information ( ); prices ( ); samples ( ) of Santoflex B.

Name_____ Title_____
Company_____
Address_____
City_____ State_____

SERVING INDUSTRY... WHICH SERVES MANKIND

NOW YOUR WORN BANBURYS REBUILT And Back In Service *In Less Than Half The Usual Time*

Ready For Interchange

Banbury bodies, #9, spray or jacketed, completely rebuilt. Exchange for your worn Banbury.

Two to three weeks is about all the time your Banbury would be out of production with our new "Pre-Plan" rebuilding service.

Again Interstate leads for your advantage.

Write us for full details.

When you rebuild, you want Interstate's exclusive hard-surfacing process that means longer life and amazing abrasion resistance. And you want Interstate's specially fabricated and guaranteed, standard dimension rings. And you want Interstate's thorough knowledge of what to do and how, gained from 14 years SPECIALIZED Experience.

All these are yours — PLUS our new fast "Pre-Plan" service.

Inquire here. We are located in the heart of the Rubber Industry.

SERVING THE IWS RUBBER INDUSTRY

INTERSTATE WELDING SERVICE

Main Plant: 914 Miami Street . . . AKRON 11, OHIO . . . Phone: JE 7970

EXCLUSIVE SPECIALISTS IN BANBURY MIXER REBUILDING

Sterling S

*carbon black

LOWER COMPOUNDING COSTS

Cabot Sterling S provides low compounding costs in two ways:

Pound for pound of carbon black, the cost is low.

Pound for pound of rubber in the compound, loadings are high.

Further, Cabot production capacity ensures a constant, dependable supply of this Sterling SRF* black for synthetic carcass stocks, inner tubes, and all molded rubber goods.

* semi-reinforcing

CABOT

CABOT INC.

RECIPE

(Test No. 8387-ABCD from the Barrett Rubber Research Laboratory)

FOR

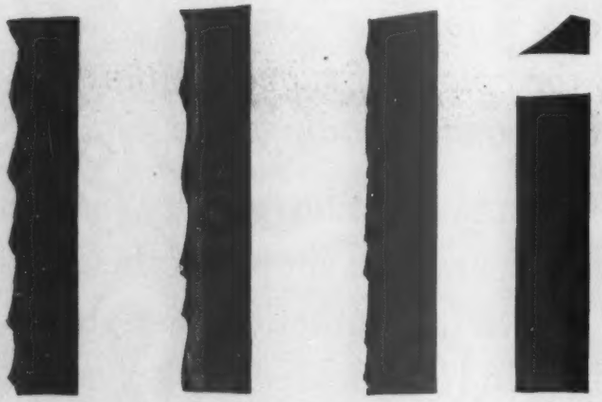
CARBONEX* 644

RUBBER COMPOUNDING HYDROCARBON IN NATURAL RUBBER COMPOUND

for Extruded Products

	Parts by Weight
Smoked Sheets	100
Channel Black (EPC)	50
Zinc Oxide	5
"BLE" 25	1
Stearic Acid	3
Sulfur	3
Benzothiazyl Disulfide	0.75
CARBONEX* 644 Rubber Compounding Hydrocarbon	0 to 30

(see photographs below)



0 10 20 30

These photographs illustrate the plasticizing action of Barrett CARBONEX* 644 rubber compounding hydrocarbon when used in a test recipe containing a moderate loading of channel black. Note the effect of the hydrocarbon on the extruding properties of the elastomer.

Each increment of Barrett CARBONEX* 644 rubber compounding hydrocarbon results in progressive improvement of surface smoothness and sharpness of definition of the Garvey die extrusions.

This characteristic of Barrett CARBONEX* 644 rubber compounding hydrocarbon, coupled with its moderate cost and good dispersion and processing qualities, accounts for its wide use in the design of compounds for the manufacture of calendered or extruded products where low nerve, smooth surface and sharp edges are essential.

Barrett*

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.
*Reg. U. S. Pat. Off.

United Blacks

Plainly and distinctively colored designations make United bags for each type of carbon black easy to identify . . . another advantage in using United Blacks.

UNITED CARBON COMPANY, INC.

NEW YORK • AKRON • CHARLESTON 27, W. VA. • CHICAGO • BOSTON

KOSMOS 20—DIXIE 20, an SRF type carbon black, possesses perfect balancing of all component properties essential to satisfactory rubber performance; outstanding for ease of processing, good plasticity, fast rate of cure, high resiliency, and low heat build-up.

DIXIE 40—KOSMOS 40, an HMF type carbon black with these properties—cool mixing, smooth and rapid extrusion, fast rate of cure, high resistance to cut-growth, flex cracking and abrasion. Produced by a special process this furnace type black is especially useful for tires, tubes, footwear, and mechanical goods.

KOSMOS 50—DIXIE 50, an HMF type black, made by a new United process, in specially designed furnaces from carefully selected fuel. Featured by ease of mixing, ready dispersion, fast extrusion, low shrinkage and fine appearance of stock, also a quick curing black, yielding high modulus and tensile.

DIXIE 60—KOSMOS 60, an RF type black, new, different, and better. A fast curing black requiring low acceleration, it has been acclaimed for faster and smoother processing, high extrusion efficiency, less rejects at tuber, low shrinkage, glossy smoothness, dense appearance, freedom from ragged edges and for outstanding reinforcement for resistance to tread wear.

RESEARCH DIVISION

UNITED CARBON COMPANY, INC.

Charleston 27, West Virginia

Use

Low-cost

dependable

Piccolyte

the versatile resin

for Extending, Tackifying, Cementing

You can save money and get a better product by using PICCOLYTE synthetic resins for compounding your rubber. Available in several grades, with melting points from 10° to 115° C. Chemically inert, thermoplastic, non-yellowing, pale color, soluble in petroleum solvents. WRITE for complete details.

PENNSYLVANIA INDUSTRIAL CHEMICAL CORPORATION

CLAIRTON, PENNSYLVANIA

Plants at Clairton, Pa. and Ch[illegible], Pa.

Makers of: Coumarone Resins • Coal Tar Solvents • Styrene Resins • Rubber Plasticizers • Reclaiming Oils • Terpene Resins • High Solvency Naphthas • Solvent Oils

Distributed by:
HAZWICK STANDARD CHEMICAL CO.,
Akron 2, Ohio

"FINISHES"... *by Stanley*

New plastic beach toys as well as familiar rubber goods are made *more attractive* and *more saleable* by Stanley finishes.

For example, plastic beach toys are printed in bright patterns with special inks developed by Stanley for this purpose. Rainboots and numerous other rubber articles get a special lacquer that brightens and protects the rubber surface.

And, in the Stanley research laboratories, a staff of specialists is busily at work creating other finishes to meet the special needs of today's sales - minded manufacturers . . . finishes that dress up a product as well as protect the materials from which it is made. Why not consult us about *your* problems in finishing wood, plastics, rubber, metal, fabrics? Address Stanley Chemical Co., East Berlin, Conn.

STANLEY

STANLEY CHEMICAL

INDUSTRIAL COATINGS

LACQUERS SYNTHETICS JAPANS ENAMELS

Calco

RETARDER PD*

RETARDER PD is a non-toxic, fine white powder with a specific gravity of approximately 1.50.

RETARDER PD gives good retarding or anti-scorch effects at processing temperatures and very little or no retarding effect at curing temperatures. It is practically *non-discoloring* so that it may be used in white and light colored stocks.

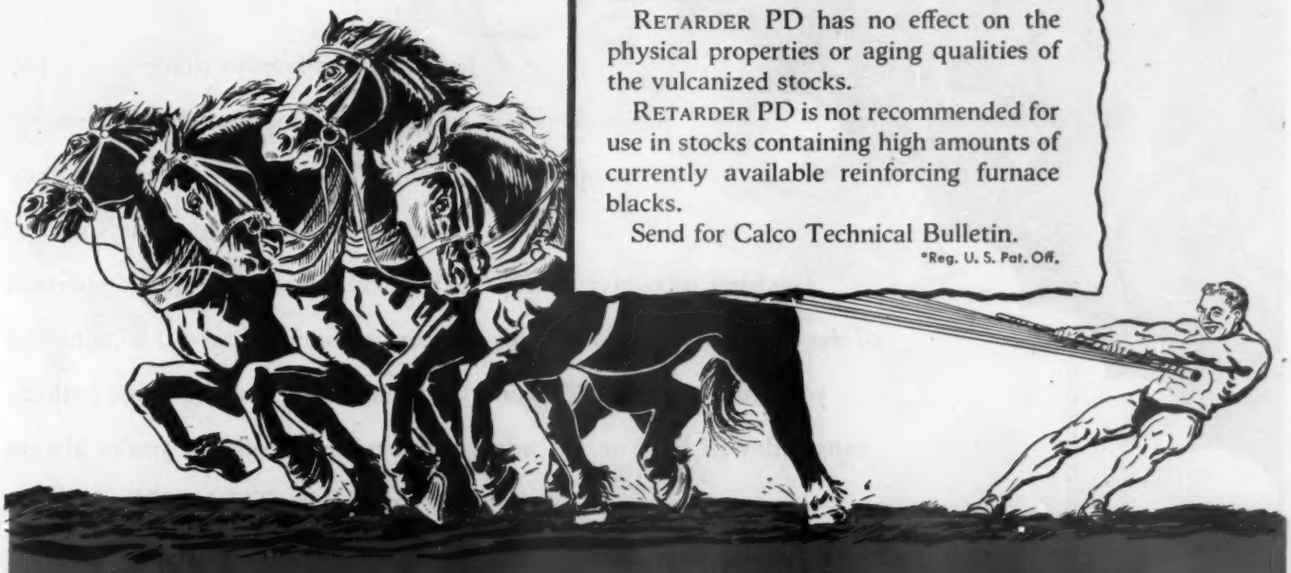
RETARDER PD is very effective with the thiazole type of accelerators or with combinations of the thiazole accelerators and guanidine accelerators or thiuram disulfides.

RETARDER PD has no effect on the physical properties or aging qualities of the vulcanized stocks.

RETARDER PD is not recommended for use in stocks containing high amounts of currently available reinforcing furnace blacks.

Send for Calco Technical Bulletin.

*Reg. U. S. Pat. Off.



Calco

RUBBER CHEMICALS DEPARTMENT

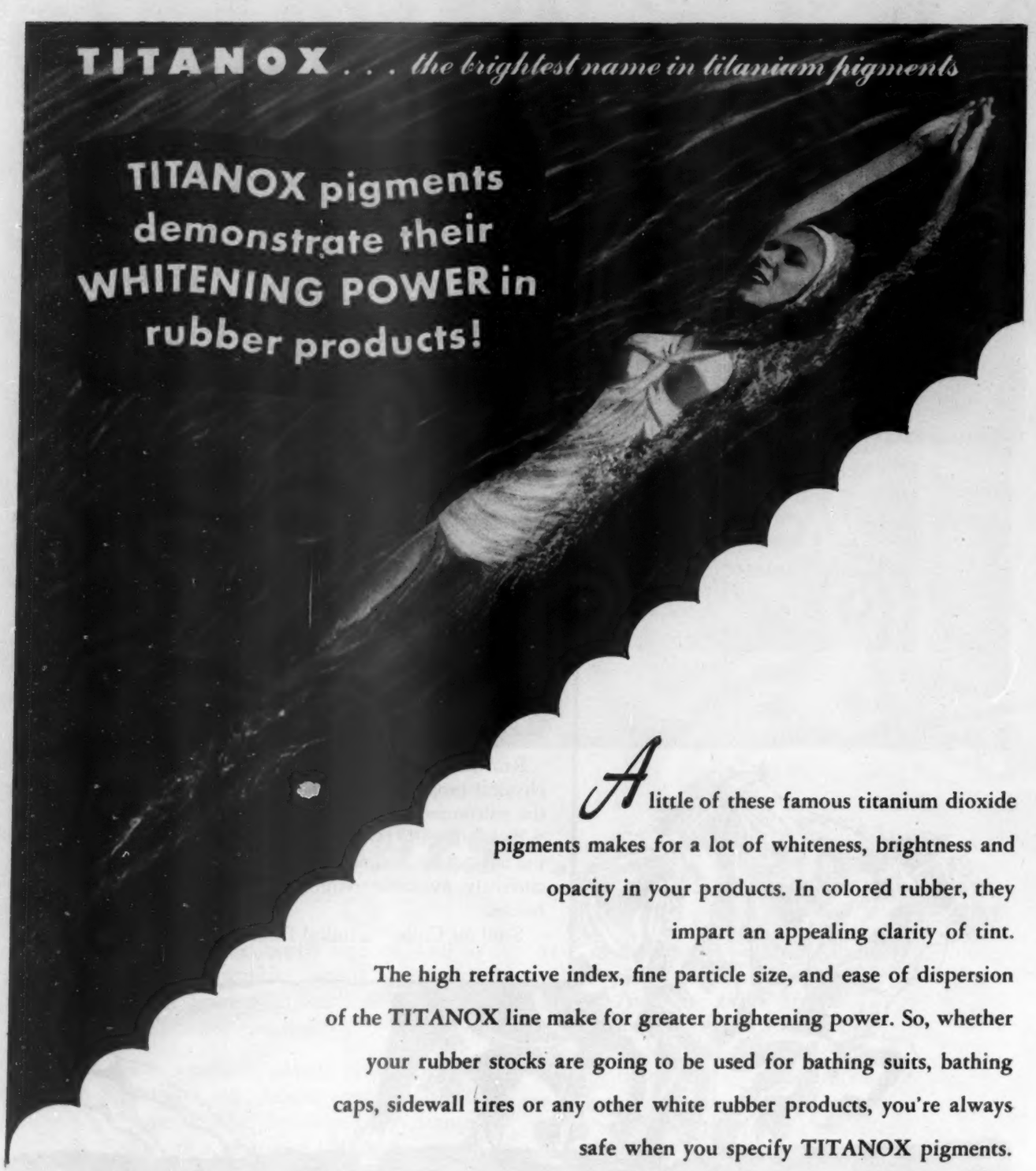
CALCO CHEMICAL DIVISION

AMERICAN CYANAMID COMPANY

BOUND BROOK • NEW JERSEY

SALES REPRESENTATIVES AND WAREHOUSE STOCKS: Akron Chemical Company, Akron, Ohio • Ernest Jacoby & Company, Boston, Mass. • Herron & Meyer of Chicago, Chicago, Ill. • H. M. Royal, Inc., Los Angeles, Calif. • H. M. Royal, Inc., Trenton, N. J. In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto.

TITANOX . . . *the brightest name in titanium pigments*



A little of these famous titanium dioxide pigments makes for a lot of whiteness, brightness and opacity in your products. In colored rubber, they impart an appealing clarity of tint.

The high refractive index, fine particle size, and ease of dispersion of the TITANOX line make for greater brightening power. So, whether your rubber stocks are going to be used for bathing suits, bathing caps, sidewall tires or any other white rubber products, you're always safe when you specify TITANOX pigments.

Our Technical Service Laboratory will be glad to help solve your pigmentation problems. This service is available through our nearest office.

6217

TITANOX

Reg. U. S. Pat. Off.

TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT

111 Broadway, New York 6, N. Y.
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350 Townsend St., San Francisco 7, Cal.
2600 S. Eastern Ave., Los Angeles 22, Cal.

PARA-FLUX

QUALITY IS ALWAYS THE SAME

BY THE TANK CAR

OR BY THE DRUM

For 26 years PARA FLUX has been the Standard of the Rubber Industry, its quality is always the same whether you are a drum or tank car user.

The C.P. Hall Co.
CHEMICAL MANUFACTURERS

AKRON, OHIO • LOS ANGELES, CALIF. • CHICAGO, ILL. • SAN FRANCISCO, CALIF.

Jim, have you heard about the naphtha put out recently by one of the big oil companies?
Yes, Tom, but I'm sticking to SKELLYSOLVE! When all's said and done, it's the "real McCoy!"

"DOC" MacGEE SAYS: There *must* be a reason for the wide and growing preference that purchasing agents, chemists, superintendents and managers have for SKELLYSOLVE. They *know* they can't go wrong by ordering SKELLYSOLVE for their operations. Why? Because SKELLYSOLVE'S unvarying high quality, dependability, purity, and economy are *proved!*

Skelly Oil Company *pioneered* the large scale production of the hexane, heptane, and octane type naphthas from natural gas . . . began back in 1930. A development that has provided special industrial naphthas with a quality exceeding anything ever known in the petroleum industry before.

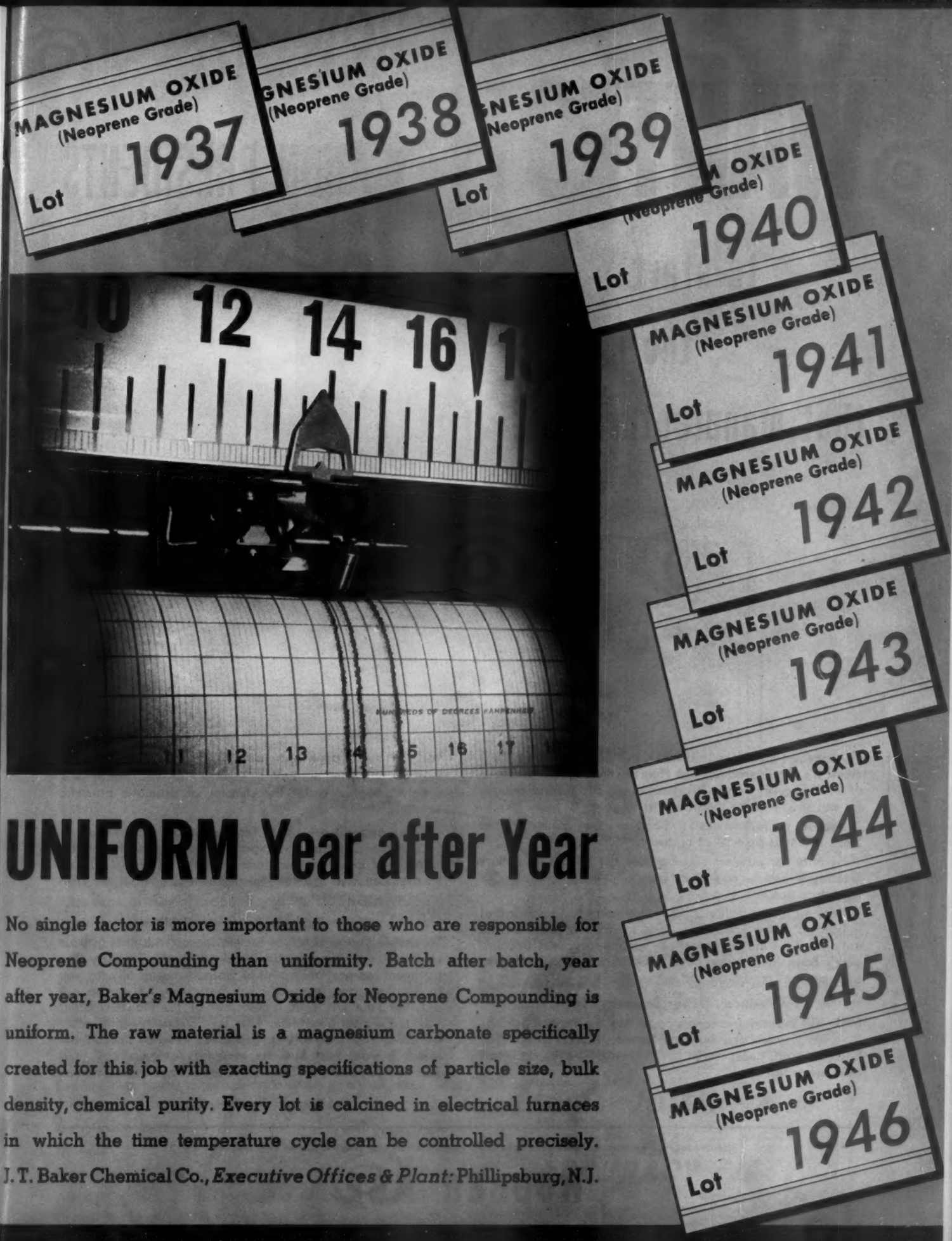
High-quality SKELLYSOLVE has enabled the rubber, oil and fat, ink and other industries to save money, improve operations, and produce better products. For proof of this, consider the fact that numerous plants have switched to SKELLYSOLVE from the competitive naphthas or solvents they were using—and that more plants are changing to SKELLYSOLVE every day.

Yes, SKELLYSOLVE is giving more satisfactory results in more and more industrial operations. Remember this when you hear of other naphthas claimed to be "just as good as" or even "better than" SKELLYSOLVE. Remember that, when all is said and done, SKELLYSOLVE is the "real McCoy"!

Skellysolve

SKELLY

SOLVENTS DIVISION, SKELLY OIL COMPANY, KANSAS CITY, MO.



UNIFORM Year after Year

No single factor is more important to those who are responsible for Neoprene Compounding than uniformity. Batch after batch, year after year, Baker's Magnesium Oxide for Neoprene Compounding is uniform. The raw material is a magnesium carbonate specifically created for this job with exacting specifications of particle size, bulk density, chemical purity. Every lot is calcined in electrical furnaces in which the time temperature cycle can be controlled precisely.

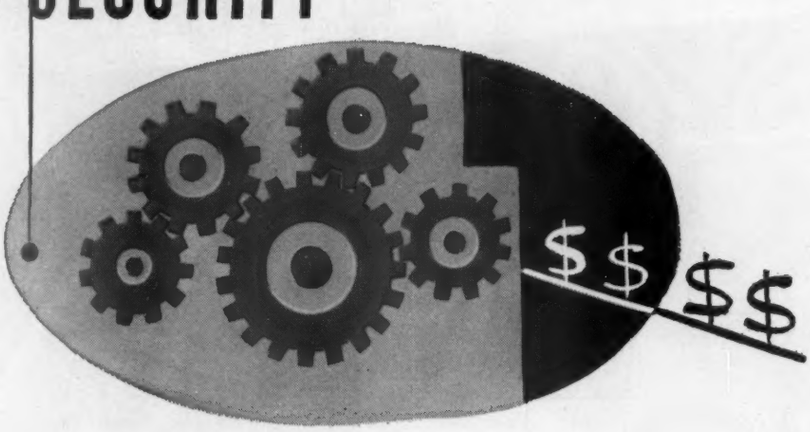
J. T. Baker Chemical Co., *Executive Offices & Plant:* Phillipsburg, N.J.

Baker's Chemicals

C. P. ANALYZED • FINE • INDUSTRIAL

WANTED CORPORATION PRESIDENTS

to start the machine that manufactures SECURITY



This machine operates best when started by top management! It's the *Payroll Savings Plan* for the regular purchase of U. S. Security Bonds. It produces security for individuals, for business, and for the nation at large.

Security for individuals . . . because every $3 invested in Security Bonds pay $4 at maturity.

Security for business . . . because the billions of dollars already invested—and being invested—in Bonds are building future purchasing power.

Security for the nation . . . because every Bond dollar that is built up in the Treasury is used to retire a dollar of the national debt that is potentially inflationary, and because every Bond held means fewer dollars to go to market to bid up prices on scarce goods.

Produces Other Benefits, Too!

In 19,000 industrial concerns operating the Payroll Savings Plan, employees are more contented. Worker production has increased, absenteeism has decreased—even accidents have been fewer!

Why Should Top Management "Press the Button"?

Begun in war-time, the Payroll Savings Plan was rapidly and widely adopted under the stimulus of dramatic patriotic appeals.

Those appeals are gone. Yet the reasons for investing in Security Bonds today are important. Management men can understand these reasons—and have the influential authority that's needed to "start the machine". . . to get the Plan vigorously promoted.

Your Task Is Easy—and Vital!

To enable you to install or to reinvigorate the Plan in your company, with minimum time and effort, the Treasury Department has prepared a kit of materials especially for you to distribute among specific key personnel. Be sure to get and use your kit! Your sponsorship of the Plan will bring you its greatest benefits in your own company—and you'll be doing your part to help guarantee America's security—***which is your best business security.*** For help, call your Treasury Department's State Director, Savings Bonds Division.

The Treasury Department acknowledges with appreciation the publication of this message by

RUBBER AGE

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council.

TAYLOR Fulscope Controllers are the time proven work horses of the rubber industry. They have long been famous for accurately and automatically maintaining temperatures and pressures. This new Fulscope with Limited Range Sensitivity is particularly adapted to many rubber industry applications. In fact, the sensitivity range, by its very limits, prevents the operator from unknowingly making adjustments which might give poor performance. Use for jobs like this:

Tire and Tube Vulcanizing

Curing mechanical goods in platen presses, and in horizontal and vertical vulcanizer

De-vulcanizers

Dryers

Bag Water Lines

Available with a wide selection of temperature and pressure ranges, bulb forms and connections; also in Time-Schedule and Process-Timer forms.

These simple, dependable and economical Fulscope Controllers are built to help you turn out top quality products at lowest possible cost. Ask your Taylor Field Engineer. Or write for Bulletin 98153. Taylor Instrument Companies, Rochester, N.Y., or Toronto, Canada.

Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

SUBJECT: REPLACEMENT OF WYEX (EPC) BY MODULEX (HMF) IN NATURAL RUBBER TREAD TYPE COMPOUND

Effect on physical properties of Wyex tread stock in which 10%, 20%, 30%, and 40% of the Wyex has been replaced by Modulex (HMF) black.

COMPOUNDS

	A	B	C	D	E
Smoked Sheets	100	100	100	100	100
WYEX (EPC)	50	45	40	35	30
MODULEX (HMF)	–	5	10	15	20
Zinc Oxide	5	5	5	5	5
Sulfur	2.75	2.75	2.75	2.75	2.75
Mercaptobenzothiazole	.875	.825	.775	.725	.675
Stearic Acid	4.	4.	4.	4.	4.
Pine Tar	2.5	2.5	2.5	2.5	2.5
Antioxidant	1.5	1.5	1.5	1.5	1.5

PHYSICAL DATA

Abrasion Resistance (% Comparison)	100	94.4	93.9	91.4	86.6
Heat Generation	384	348	346	314	308
Tensile	4000	3915	3800	3750	3705
Elongation	580	580	597	600	603
Modulus @ 400%	2120	2220	2140	2100	2080
Rebound	67.4	68.0	68.2	70.6	71.4

SUMMARY

1. Resistance to abrasion is reduced progressively from 5.6% to 13.4%.
2. Heat generation is materially reduced.
3. Ultimate tensile is progressively reduced from 2% to 8%.
4. Modulus remains constant and elongation increases slightly.
5. Rebound increases progressively from 1 to 4 points.

J. M. HUBER CORPORATION, 342 MADISON AVENUE, NEW YORK 17, NEW YORK
MANUFACTURERS OF: WYEX (EPC) • MODULEX (HMF) • ESSEX (SRF) • SUPREX CLAY • PARAGON CLAY • RUBBER CHEMICALS